

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

an IP transfer network contains two, or more connection servers, and a media router outside said IP transfer network is connected to a terminal having a transmittance/reception function of digital media;

a call setting IP packet is transmitted from said media router to the connection servers; said connection server provided on the telephone calling side determines both a communication line for an inter-terminal communication within said IP transfer network and a circuit identification code for identifying said communication line by employing both a telephone number provided on the telephone calling side and a telephone number provided on the call reception side, and produces an initial address message containing said circuit identification code;

said produced initial address message is transmitted to the connection server provided on the call reception side, said connection server on the call reception side transmits a call setting IP packet to the media router on the call reception side, and said media router on the call reception side transmits said call setting IP packet to the terminal on the call reception side;

said connection server on the call reception side produces an address completion;

said address completion message and transmits said received address completion message is transmitted to said connection server on the telephone calling side;

when a report of telephone calling operation is received from the terminal on the call reception side, said connection server on the call reception side produces a call pass message; said call pass message reaches to said connection server on the telephone calling side; and said connection server on the calling side transmits the report of telephone calling operation of the terminal on the call reception side to the media router on the telephone calling side;

upon receipt of a response issued from the terminal on the call reception side, said connection server on the call reception side produces a response message; said response message reaches to said connection server on the telephone calling side; said connection server on the telephone calling side stops the calling sound of the terminal on the call reception side; both said terminal on the telephone calling side and said terminal on the call reception side can establish an inter-terminal communication between the terminals to transmit/receive the digital media via said media routers provided on the telephone calling side and the call reception side;

a request for interrupting the inter-terminal communication is transmitted from said media router provided on either the telephone calling side or the call reception side to said connection server; a release request is sent from said connection server to another connection server; an interrupt instruction is transmitted from said another connection server to another media router, and on the other hand, a release completion is transmitted from another connection server to said server; and an interrupt completion is sent to a media router so as to connect/release the inter-terminal communication between the two terminals.

2. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 1, wherein:
an initial address message, a call pass message, a response message, a release message, and a release completion message are transmitted/received between said connection server on the telephone calling side and said connection server on the call reception side, and an address completion message is omitted.

D2 3. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 1, wherein:
after the inter-terminal communication is completed, said connection server acquires an inter-terminal communication record including a circuit identification code, a communication time instant, and a telephone number, and records the acquired communication record therein so as to be used for a charging purpose and an operation/management.

4. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 1, wherein: said terminal is a telephone set, said digital media is digitalized voice and said media communication is telephone communication.

5. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 1, wherein: said terminal is an IP terminal, said digital media is characters or digitalized still images and said media communication is IP data communication.

6. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 1, wherein: said terminal is a voice-moving image transmission/reception terminal, said digital media is digitalized voice-moving image and said media communication is voice-moving image communication.

7. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 1, wherein: said terminal is a facsimile terminal, said digital media is digitalized facsimile image and said media communication is facsimile communication.

8. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 1, wherein: said telephone number is terminal discrimination number to discriminate a receiving terminal.

9. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:
while a destination multicast address is registered into an address administration table of a network node apparatus, in such a case that a destination multicast address contained in a header of an external IP packet entered into said network node apparatus is not registered in said address management table, said network node apparatus discards said external IP packet so as to avoid that an unexpected external IP packet is mixed into the IP transfer network.

10. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 9, wherein:

since registering of an address of a multicast transmitting person into an address administration table of a network node apparatus on the side of a receiving person is not allowed, an ACK packet for confirming the reception of said IP packet, which is directed from a multicast IP packet receiving person to a multicast IP packet transmitting person cannot pass through the network node apparatus.

11. (Original) A network node apparatus wherein:

while a destination multicast address is registered into an address administration table of a network node apparatus, in such a case that a destination multicast address contained in a header of an external IP packet entered into said network node apparatus is not registered in said address administration table, said network node apparatus discards said external IP packet so as to avoid that an unexpected external IP packet is mixed into the IP transfer network.

12. (Original) A network node apparatus wherein:

since registering of an address of a multicast transmitting person into an address administration table of a network node apparatus on the side of a receiving person is not allowed, an ACK packet for confirming the reception of said IP packet, which is directed from a multicast IP packet receiving person to a multicast IP packet transmitting person cannot pass through the network node apparatus.

13. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

when a network node apparatus detects an IP packet which a domain name server is a receiver IP address, the received IP packet is transferred to a domain name server only when a combination of sender IP address of said IP packet and a communication line inputted said IP packet is included in an address administration table of said network node apparatus, thereby to register an allowance of inter-terminal communication.

14. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 2, wherein:

in order to perform a telephone communication between a first dependent type IP telephone set and a second dependent type IP telephone set, when a handset of said first dependent type IP telephone set is taken up, said first dependent type IP telephone set forms an IP packet containing the telephone number of said second dependent type IP telephone set, the IP packet reaches first network node via said first H323 termination unit and a first domain name server inside the first media router, the first network node apparatus sends said IP packet to a second domain name server inside an integrated IP transfer network, said second domain name server returns a second IP address corresponding to the telephone number of said second dependent type IP telephone set in an 1-to-1 correspondence relationship via said first domain name server or without passing through said first domain name server to said first H323 termination unit, when said first H323 termination unit forms and sends an IP packet with a destination IP address as being said second IP address, said IP packet passes through said second H323 termination unit, said second network node apparatus, said more than one router inside said IP transfer network, said first network node apparatus and said first H323 termination unit, and reaches said first dependent IP telephone set;

when said first user hangs up a handset upon completion of telephone communication, an IP packet indicating the completion of telephone communication is formed/transmitted with a source IP address as being said first IP address and a destination IP address as being said second IP address;

when said IP packet passes through said first H323 termination unit, said first network node apparatus, said more than one router inside said IP transfer network, said second network node apparatus and said second H323 termination unit, and reaches said second dependent IP telephone set, thereby enabling said second user to acknowledge the completion of telephone communication.

15. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 14, wherein:

said second dependent type IP telephone set is directly connected via a communication line to another network node apparatus.

16. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 14, wherein:

plural sets of said second dependent type IP telephone sets are employed; and
said plural IP telephone sets are directly connected to each other via a communication line to another network node apparatus.

17. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein: dependent type voice/image apparatus 1 inquires a host name of dependent voice/image apparatus 2 to an IP image dedicated domain name server inside an IP transfer network via a media router 1 and obtains IP address of said dependent voice/image apparatus 2, then said dependent voice/image apparatus 1 sends voice/image data to said voice/image apparatus 2 via a media router 1, the IP transfer network and said media router 2, thereby to carry out a voice/image communication between said dependent voice/image apparatus 1 and said dependent voice/image apparatus 2.

18. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein: independent type voice/image apparatus 1 inquires a host name of independent voice/image apparatus 2 to an IP image dedicated domain name server inside an IP transfer network via a media router 1 and obtains IP address of said independent voice/image apparatus 2, then said independent voice/image apparatus 1 sends voice/image data to said voice/image apparatus 2 via a media router 1, the IP transfer network and said media router 2, thereby to carry out a voice/image communication between said independent voice/image apparatus 1 and said independent voice/image apparatus 2.

19. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

in order to perform a telephone communication between an analog IP telephone set 1 and an analog IP telephone set 2, when a handset of said analog IP telephone set 1 is taken up, such an analog signal for notifying a telephone call is transmitted from said analog IP telephone set 1; an H323 termination unit inside a media router detects an IP packet, and returns a response IP packet to said analog IP telephone set 1;

said analog IP telephone set 1 causes an IP packet containing the telephone number of said analog IP telephone set 2 to reach a network node apparatus connected to a media router 1 via a communication line via said H323 termination unit 1 and the domain name server 1 inside said media router 1;

the network node apparatus 1 transmits said IP packet to a domain name server inside an integrated IP transfer network, and the domain name server 2 returns an IP address corresponding to the telephone number of said analog IP telephone set 2 in a 1-to-1 correspondence relationship via said domain name server 1 or without passing through said domain name server 1;

when said H323 termination unit 1 forms and sends an IP packet with an IP address in a 1-to-1 relationship with said analog IP telephone set as a source IP address and with said IP address 2 as being a destination IP address, said IP packet reaches another network node apparatus connected to said analog IP telephone set 2 via said network node apparatus 1 and more than one router inside IP transfer network, and is delivered to said H323 termination unit connected to a telephone set 2 inside another media router via a communication line;

when said user 1 starts a telephone call, said analog IP telephone set 1 sends an IP packet containing a voice sound expressed in digital form with a source IP address as being said IP address 1 and a destination IP address as being said IP address 2;

said IP packet passes through said H323 termination unit 1, said network node apparatus 1, more than one router inside said IP transfer network, the network node apparatus 2, and said H323 termination unit 2; and reaches said analog IP address 2.

20. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

said media router includes at least a domain name server, a router, a connection control unit, an H323 termination unit and an SCN interface;

said router can connect an IP terminal via an IP communication line;

said H323 interface can connect at least one of more than one dependent type IP telephone set and more than one dependent type IP voice/image apparatus via said IP communication line;

said SCN interface can connect more than one analog telephone via a telephone communication line;

an IP terminal, a dependent type IP telephone set, a dependent type IP voice/image apparatus, and an analog telephone set are connected via said media router to a network node apparatus; and

thereby to carry out an inter-terminal communication by obtaining an IP address corresponding to another network node apparatus or another network node apparatus connected to the same network node apparatus.

21. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 20, wherein:

said media router does not include any one of said domain name server and said SCN interface, or both of said domain name server and said SCN interface.

22. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

an integrated IP transfer network contains at least two sets of an IP data network, an IP telephone network, an IP voice/image network, a best effort network, an IP data multicast network, an IP base TV broadcast network and a network node apparatus;

a network node apparatus is connected via a communication line to any of more than one said IP transfer network; and

a network node apparatus terminal of said network node apparatus is connected via a communication line to an external terminal of said integrated IP transfer network.

23. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

an IP terminal and a dependent type IP telephone set are connected via a communication line to a first gateway;

an IP terminal and an IP voice/image apparatus are connected via a communication line to a second gateway; and

the terminal-to-terminal communication can be established via said first gateway, said integrated IP transfer network, and said second gateway in order that the terminal-to-terminal communication can be made via said gateways.

24. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 1, wherein:

said media router is present within a CATV gateway employed in a CATV network, and is connected via a communication line to the network node apparatus provided in the integrated IP transfer network;

said media router is connected via any one of a CATV line interface and a CATV line to the IP terminal, the analog telephone set, the IP telephone set, and the IP voice/image apparatus; and

said CATV line contains a communication lower-grated layer specific to the CATV line, and owns a function capable of transferring an IP packet in a communication network.

25. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein: an IP terminal 1 provides a host name of an IP terminal 2 to a domain name server inside an integrated IP transfer network via CATV line and a CATV gateway, and obtains an IP address of an IP terminal 2, thereby to carry out inter-terminal communication between said terminals.

26. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein: an analog telephone set 1 provides a telephone number of an analog telephone set 2 to a domain name server inside an integrated IP transfer network via CATV line and a CATV gateway, and obtains an IP address of an analog telephone set 2, thereby to carry out inter-terminal communication between said telephone sets.

27. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein: a dependent type telephone set provides a telephone number of an analog telephone set to a domain name server inside an integrated IP transfer network via CATV line and a CATV gateway, and obtains an IP address of said analog telephone set, thereby to carry out inter-terminal communication between said telephone sets.

28. (Original) A CATV gateway , wherein:

the CATV gateway includes a media router,
an IP terminal, an analog telephone set, dependent type IP telephone set, a dependent type voice/image apparatus are connected via a CATV line and a CATV interface,
an IP packet sent from said IP terminal, said analog telephone set, said dependent type IP telephone set, said dependent type voice/image apparatus are connected via a CATV line and a CATV interface is converted into an IP packet applied internal media router function and transferred to an IP transfer network, and
said IP packet received from said IP transfer network is sent to said IP terminal, said analog telephone set, said dependent type IP telephone set, said dependent type voice/image apparatus are connected via said media router.

29. (Original) A terminal receivable wireless apparatus, wherein:

the terminal receivable wireless apparatus contains an IP terminal, a dependent type telephone set, a dependent type IP voice/image apparatus, and has a function to communicate with another IP terminal, dependent type telephone set, dependent type IP voice/image apparatus via a wireless transmission/reception portion, a gateway, a network node apparatus, an IP transfer network and another network node apparatus.

30. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

an IP terminal 1 is connected to an integrated IP transfer network via a terminal receivable wireless apparatus, a wireless communication path and a wireless transmission/reception section,
said IP terminal 1 provides a host name of an IP terminal 2 to a domain name server inside said IP transfer network and obtains an IP address of said IP terminal 2, and
thereby to carry out an inter-terminal communication between said IP terminals by sending data from said IP terminal 1 to said IP terminal 2.

31. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

a dependent type telephone set 1 is connected to an integrated IP transfer network via a terminal receivable wireless apparatus, a wireless communication path and a wireless transmission/reception section,
said IP terminal 1 provides a host name of a dependent type telephone set 2 to a domain name server inside said IP transfer network and obtains an IP address of said dependent type telephone set 2, and
thereby to carry out an inter-terminal communication between said dependent type telephone sets by sending data from said dependent type telephone set 1 to said dependent type telephone set 2.

32. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

a dependent type voice/image apparatus 1 is connected to an integrated IP transfer network via a terminal receivable wireless apparatus, a wireless communication path and a wireless transmission/reception section,

said dependent type voice/image apparatus 1 provides a host name of dependent type voice/image apparatus to a domain name server inside said IP transfer network and obtains an IP address of dependent type voice/image apparatus 2, and

thereby to carry out an inter-terminal communication between said voice/image apparatuses by sending dependent type voice/image data from said dependent type voice/image apparatus 1.

33. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 29, wherein:

both data of a DNS inquiry response format transmitted from said IP terminal and text data to be transmitted/received are converted into such data having an input data format of a wireless transmission/reception unit by a wireless interface converting unit, the converted data are inputted into a wireless transmission/reception unit and are sent via a wireless communication path to said wireless transmission/reception unit, and then said data are converted into such data having a data format of an IP packet which can be entered into a gateway in said wireless interface converting unit;

both telephone call control data sent out from said dependent type IP telephone set and digitally-expressed voice data to be transmitted/received are converted into data having an input data format of the wireless transmission/reception unit by said wireless interface converting unit, and the converted data are inputted to said wireless transmission/reception unit, and then are transmitted to said gateway via said wireless communication path, the wireless transmission/reception unit, the wireless interface converting unit, and also the communication line, while being converted into data having a data format of an IP packet which can be entered to said gateway; and

both call control data of a voice/image terminal sent out from said IP telephone set and digitally-expressed voice/moving image data to be transmitted/received are converted into data having an input data format of the wireless transmission/reception unit by said wireless interface converting unit, and the converted data are inputted to said wireless transmission/reception unit, and then are transmitted to said gateway via said wireless communication path, the wireless transmission/reception unit, the wireless interface converting unit, and also the communication line, while being converted into data having a data format of an IP packet which can be entered to said gateway.

34. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 23, wherein:

a plurality of gateway communication interface function units are provided inside said gateway, depending upon communication procedure, so that said gateway communication interface function units can be adapted to various sorts of telephone communication procedures.

35. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 34, wherein:

a telephone is connected to a media router provided in a LAN having a telephone number of a public switched telephone network;

a combination of an address telephone number and a transferee gateway telephone number is set in a transfer processing unit of a switching machine; and

said telephone is connected to another telephone machine inside said LAN.

36. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

an IP transfer network includes at least a network node apparatus, a telephone administration server, a media router, a telephone domain name server, and a table administration server;

a user "i" ("i" = 1, 2, ...) sets an individual external IP address to a media route of a user, located outside said IP transfer network, and one, or more telephone sets are connected to the media router of said user "i";

said media router is connected via a communication line to any of said network node apparatus, an internal IP address "IA-i" used to communicate with said user "i" is applied to a termination portion of said communication line on the side of the network node apparatus, and a telephone number specific to a user is connected to said media router;

said telephone domain name server saves a set of the user individual telephone number, the external IP address "EA-i" of said media router and said internal IP address "IA-i";

when the user individual telephone number is inquired to the telephone domain name server, said telephone domain name server answers the external IP address and the internal IP address;

an IP communication record for determining an IP communication path between said media router and a pilot telephone administration server is set to said network node apparatus;

as a request of a source telephone set, said IP communication record is employed, and said IP communication record is transferred via the pilot telephone administration server to a telephone administration server;

said telephone administration server requests said telephone domain name server to acquire both the external IP address and the internal IP address ("EA-i, IA-i") of the transmission source media router from a source telephone number, and both an external IP address and an internal IP address ("EA-j, IA-j") of a destination media router from a destination telephone number;

while the telephone administration servers provided on both the transmission source side and the destination side execute a series of procedures in combination with the media routers on the sides of the transmission source and the destination, and the telephone set, said table administration server sets said four IP addresses as an IP communication record between the transmission-source-sided network node apparatus and the destination network node apparatus and as another IP communication record between the source telephone set and the destination-sided telephone set; and

when the telephone communication is ended, said telephone administration server requests said table administration server to delete said IP communication records.

37. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 36, wherein:

when the telephone set on the transmission source side requests a telephone call setting operation, the telephone set on the transmission source side exclusively determines a circuit identification code used to identify a communication line for telephone voice from a set of the destination telephone number and the source telephone number;

the telephone administration server on the transmission source side transmits an IAM packet containing said circuit identification code for requesting the telephone call setting operation to the telephone administration server on the destination side;

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the telephone administration server on the destination side returns an ACM packet for reporting the reception of said IAM packet to the telephone administration server on the transmission source side;

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when the telephone set on the destination side produces a telephone call reception sound, the telephone management server on the destination side transmits a CPG packet for notifying a call reception to the telephone administration server on the transmission source side;

when the telephone set on the destination side responds to the call setting request, the telephone administration server on the destination side transmits an ANM packet indicative of a response to the call setting request to the telephone administration server on the transmission source side, and then, the telephone set on the transmission source side stops the calling sound thereby allowing to enter a communication phase;

when communication is completed and when a call-interrupting request is transmitted, the telephone administration server on the call-interrupting request said forms a REL packet requesting the completion of telephone communication using the circuit identification code and transmits the RLC packet to the telephone administration server on the call-interrupted side; and said telephone administration server on the call-interrupted side returns an acknowledgement reporting the reception of the REL packet.

38. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 36, wherein:

- a payload portion of an IP packet is of UDP segments;
- a telephone call connection phase and telephone release phase has only one port number;
- a sole call control program to manage the connection phase and the telephone release phase is usable on different communication lines; and
- a different voice from a different telephone set can be sent even if the media router is the only IP address by way of allocating a different UDP port number to each telephone set.

39. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 36, wherein:

in order that one telephone administration server may solo play the function of the transmission-sided telephone administration server and the function of the reception-sided telephone administration server, said telephone administration server performs procedures of a telephone connection phase and a telephone release phase via the pilot telephone administration server is combination with a transmission source media router and a destination media router.

40. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 36, wherein:

said telephone administration server employs the communication company segment table of the telephone number in order to know as to whether the destination telephone number belongs to an IP telephone network operated/managed by the own communication company, or an IP telephone network operated/managed by another communication company.

41. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 36, wherein:

a telephone set having a destination telephone number employs a telephone administration server segment table of telephone numbers in order to know that the own telephone set joins to which network node apparatus.

42. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 36, wherein:

D4 an operation administration server acquires a telephone communication record containing a circuit identification code, a communication time instant, and a telephone number; and said operation administration server notifies the acquired telephone communication record to an operation administration server and a charging server so as to exclusively manage the network thereby to enhance the reliability of controlling the terminal-to-terminal communication connection.

43. (Original) A media router wherein:

more than two telephone sets are stored; voice inputted to an analog telephone set is digitalized by an analog interface unit to be sent to a media router major unit; voice entered into an IP telephone set is digitalized to be sent to the media router major unit; an IP packet on which the telephone voice is superimposed is transmitted from the media router major unit via a line interface unit to a network node apparatus of an IP transfer network; and said IP package is allocated with a telephone number of either of the telephone sets and with an address administration table.

44. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

an IP transfer network includes more than two network node apparatus;
a media router is connected to an IP communication line to any one of said network node apparatus;
an internal IP address is applied to a logic terminal of a termination unit on the side of said network node apparatus of the IP communication line;
an external IP address is applied to each of the media routers, and also said media router is connected via a communication line to more than one telephone set;
as a record of an address management table provided in said network node apparatus, both said external IP addresses and said internal IP addresses are contained, and an IP communication record for defining an IP capsulation method is previously set; and
a telephone communication connection control and a telephone communication release control are carried out between the telephone set connected to said media router and another telephone set connected to another media router.

45. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 44, wherein:

a media router containing a telephone number server is employed, and said telephone number server answers an IP address when a telephone number is inquired.

D5 46. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 44, wherein:

a telephone call connection phase is carried out by transmitting a call setting IP packet which contains at least a source telephone number and a destination telephone number.

47. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 46 wherein:

a connection control of a telephone call identifier is attained by using a common port number for a plurality of telephone sets and individual voice communication in each telephone set is attained by allocating a different port number to each telephone set.

48. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein: an inter-terminal communication for a telephone communication comprising call set, call set reception, call process and response is carried out by transmitting/receiving an IP packet inside IP transfer network and is moved to a service phase, and said service phase is completed by transmitting/receiving said IP packet via a step comprising release and release completion.

49. (Original) A media router wherein:

said media router includes a telephone number server which answers an IP address when a telephone number is inquired;

at an initial stage, the telephone number server is inquired to get an answer for the IP address and then a telephone call setting packet is formed by use of said IP address; and said IP address is transmitted to start the connection phase of telephone communication.

50. (Previously Presented) A media router as claimed in Claim 49 wherein:

at least a source telephone number and a destination telephone number are contained inside a telephone call setting IP packet.

51. (Original) A media router as claimed in Claim 49 wherein:

said media router stores one, or more telephone sets, and contains one, or both functions of a PBX control unit and a telephone control unit.

52. (Original) A media router as claimed in claim 49 wherein:

an IP packet voice/image transmitter/receiver, an IP terminal, or a communication line capable of transmitting/receiving an IP packet to/from a LAN can be connected to the media router.

53. (Previously Presented) A media router as claimed in claim 49 wherein:

a telephone call priority order control administration table is contained in said media router;

a source port number contained in an IP packet is used, which is transmitted from a telephone set, or an IP terminal, or a moving image transmitter/receiver, connected to said media route; and

said IP packet is transmitted to a communication line on the network node apparatus side in the order of priority in accordance with the designation of the telephone call priority order control administration table.

54. (Previously Presented) A media router as claimed in claim 49 wherein:

a telephone call priority order control administration table is contained in said media router; and

while a set of an IP address and a source port number of either a TCP segment contained in an IP packet is used, which is transmitted from a telephone set, an IP terminal, or a moving image transmitter/receiver, which is connected to said media router;

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said IP pocket is transmitted to a communication line on the network node apparatus side in the order of priority in accordance with the designation of the telephone call priority order control administration table.

55. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

an IP transfer network includes more than two network node apparatus;

a media router is connected to an IP communication line to any one of said network node apparatus;

an internal IP address is applied to a logic terminal of a termination unit on the side of said network node apparatus of the IP communication line;

an external IP address is applied to each of the media routers, and also said media router is connected via a communication line to more than one telephone set;

as a record of an address administration table provided in said network node apparatus, both said external IP addresses and said internal IP addresses are contained; and

an IP communication record is set in order that a telephone communication is carried out among preselected companies A-1, A-2, ..., A-N ("N" being larger than 2), so that a closed-area telephone communication can be carried out.

56. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 55 wherein:

a telephone set of the company A-1 which is connected to a closed-area telephone communication network which is effective among the preselected companies A-1, A-2, ..., A-N ("N" being larger than 2) can establish a telephone communication with a telephone set having an extension telephone number of the company A-1; and

telephone sets of the companies other than the company A-1 cannot establish telephone communications with the telephone set having the extension telephone number of the company A-1.

57. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

an IP transfer network includes more than two network node apparatus;

a media router is connected to an IP communication line to any one of said network node apparatus;

an internal IP address is applied to a logic terminal of a termination unit on the side of said network node apparatus of the IP communication line;

an external IP address is applied to each of the media routers, and also said media router is connected via a communication line to more than one telephone set;

as a record of an address administration table provided in said network node apparatus, both said external IP addresses and said internal IP addresses are contained, and an IP communication record for defining an IP capsulation method can be previously set; and

while more than one IP communication record is previously set which is supplied to a terminal-to-terminal communication within such a closed-area communication network for limiting a communication counter party, such an IP communication record which is supplied to a terminal-to-terminal communication not for previously limiting the communication counter party is newly set in a connection phase in response to a connection request among terminals,

and thereafter is supplied to the terminal-to-terminal communication; and also said IP communication record is deleted.

58. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 57 wherein:

in the closed-area telephone communication for limiting the communication counter party, the telephone number server contained in said media router, whereas in the closed-area telephone communication for not limiting the communication counter party, the telephone number server provided in the IP transfer network is used.

59. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 57 wherein:

an IAM packet, an ACM packet, a CPG packet, an ANM packet, a REL packet, and a RLC packet are transmitted/received between the telephone administration server on the telephone calling side and the telephone administration server on the telephone reception side.

60. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 59 wherein:

after a response, a response confirmation is carried out; and a release acceptance is carried out between a release and a release completion.

61. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

in an open-area telephone communication, a communication line employed in a voice communication can be separated from an IP communication line.

62. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 57 wherein:

a telephone number server owns a CIC administration table, and can record a source telephone number, a destination telephone number, a starting time instant of a telephone communication, and an end time instant thereof on said CIC administration table.

63. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 57 wherein:

an operation administration server inquires a source telephone number, a destination telephone number, a starting time instant of a telephone communication, and an end time instant thereof in order to use the acquired items for charging operation.

64. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 57 wherein:

a telephone calling line number administration is carried out.

65. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 57 wherein:

a telephone call reception line number administration is carried out.

66. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 57 wherein:

the network node apparatus owns a function capable of separating an IP packet for a terminal-to-terminal communication connection from an IP packet for a voice communication, which are inputted outside the IP network; and

said network node apparatus synthesizes IP packets sent from the IP network to the network node apparatus to thereby send out the synthesized IP packet to the media router.

67. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

a relay exchanger of public switched network and a gateway 1 of IP transfer network is connected with NNI interface communication line;

a telephone set "TN-1" of telephone number "TN-1" connected to a subscriber exchanger "X1" of said public switched network is connected, as a telephone number "TN-1", to a media router connected to said transfer network;

when a telephone call connection is requested from a telephone set "T-2" of telephone number "TN-2" connected to a subscriber exchanger "X2" of said public switched network to telephone number "TN-1", said call connection request reached said subscriber exchanger "X1"; and

said call connection request reaches said telephone set "T-1" connected with said relay exchanger, said NNI interface communication line, said gateway 1, said IP transfer network and said media router due to receiving transfer function of said subscriber exchanger "X1".

68. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

a subscriber exchanger of public switched network and a gateway 2 of IP transfer network is connected with UNI interface communication line;

a telephone set "TN-1" of telephone number "TN-1" connected to a subscriber exchanger "X1" of said public switched network is connected, as a telephone number "TN-1", to a media router connected to said transfer network;

when a telephone call connection is requested from a telephone set "T-2" of telephone number "TN-2" connected to a subscriber exchanger "X2" of said public switched network to telephone number "TN-1", said call connection request reached said subscriber exchanger "X1"; and

said call connection request reaches said telephone set "T-1" connected with said subscriber exchanger, said UNI interface communication line, said gateway 2, said IP transfer network and said media router due to receiving transfer function of said subscriber exchanger "X1".

69. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

in order to make a telephone communication from a telephone set which is connected to a public switched telephone network to another telephone set which is connected via an IP transfer network to another public switched telephone network;

information of the input line supplied to the IP transfer network which is employed so as to connect a telephone communication line from said public telephone network to said IP transfer network is inquired to the internal gateway of said IP transfer network which contains

line information, and is acquired while a telephone number of a destination telephone set is used as a parameter; and

in this case, said gateway containing said line information refers to an IP transfer network input line table thereof.

70. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

in order to make a telephone communication from a telephone set which is connected to a public switched telephone network to another telephone set which is connected via an IP transfer network to another public switched telephone network;

information of the input line supplied to the IP transfer network which is employed so as to connect a telephone communication line from said public telephone network to said IP transfer network is inquired to the input line information server which is provided outside of said IP transfer network, and is acquired, while a telephone number of a destination telephone set is used as a parameter; and

in this case, an input line information server refers to an IP transfer network input line table thereof.

71. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

in order to make a telephone communication from a telephone set which is connected to a public switched telephone network to another telephone set which is connected via an IP transfer network to another public switched telephone network;

as information of the output line supplied outside the IP transfer network which is employed so as to connect a telephone communication line from said IP transfer network to said public telephone network, internal output line information of said IP transfer network is used while a telephone number of a destination telephone set is used as a parameter.

72. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

in order to make a telephone communication from a telephone set which is connected to a public switched telephone network to another telephone set which is connected via an IP transfer network to another public switched telephone network;

information of the output line supplied outside the IP transfer network which is employed so as to connect a telephone communication line from said IP transfer network to said public telephone network is inquired to the internal gateway of said IP transfer network while a telephone number of a destination telephone set is used as a parameter;

said gateway inquires to a telephone number server employed in the IP transfer network; and then said telephone number server responds thereto.

73. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 69 wherein:

information of the said input line supplied to the IP transfer network corresponds to information of accessing obtained via an NNI or a UNI communication line; and information of the output line supplied outside the IP transfer network corresponds to information of accessing via an NNI or a UNI communication line.

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74. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 70 wherein:

information of said input line supplied to the IP transfer network corresponds to information of accessing via an NNI or a UNI communication line; and information of the output line supplied outside the IP transfer network corresponds to information of accessing via an NNI or a UNI communication line.

75. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 71 wherein:

information of the input line supplied to the IP transfer network corresponds to information of accessing via an NNI or a UNI communication line; and information of said output line supplied outside the IP transfer network corresponds to information of accessing via an NNI or a UNI communication line.

76. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 72 wherein:

information of the said input line supplied to the IP transfer network corresponds to information of accessing obtained via a UNI communication line; and information of said output line supplied outside the IP transfer network corresponds to information of accessing via an NNI communication line.

77. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 69 wherein:

the gateway containing the line information is identified from a exchanger of the public switched telephone network based upon a point code.

78. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

a communication line for a telephone communication connection control is separated from a voice communication line between a termination gateway equipped with an encapsulation function and a relay gateway; and

a telephone communication is carried out between two telephone sets via a telephone set 1, a termination gateway equipped with a capsulation function, a relay gateway, an NNI interface communication line, a public switched telephone network, and a telephone set 2 in this order.

79. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 78 wherein:

a telephone number server employed in said termination gateway equipped with the encapsulation function, and a relay control unit employed in the relay gateway own individual CIC administration tables; and manage circuit identification codes by employing the respective CIC administration tables.

80. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 78 wherein:

the relay control unit retrieves a signaling point address administration table and indicates a telephone number of a destination telephone set so as to acquire a signaling point address of such a exchanger for managing said destination telephone set.

81. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 78 wherein:

the relay control unit determines a circuit identification code and a signaling link selection based upon a rule which is previously determined with respect to the public switched telephone network.

82. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 78 wherein:

a conversion between an IP packet and a signaling unit is carried out by employing an address connection table employed in the relay control unit within the relay gateway, which holds address information contained in an IP packet and label information contained in a signaling unit.

83. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 78 wherein:

while using a media connection table contained in a voice control unit provided in the relay gateway, a converting operation between an IP packet for storing digital voice, and a voice signal which is transferred through a voice communication line of the NNI communication line is carried out.

84. (Original) A relay control unit wherein:

in the method claimed in Claim 78, while using an address connection table which contains both address information contained in an IP packet and label information contained in a signaling unit, a conversion operation between the IP packet and the signaling unit is carried out.

85. (Original) A voice control unit wherein:

in the method claimed in Claim 78, while a media path connection table, the voice control unit performs a conversion operation between an IP packet for storing digital voice, and a voice signal transferred through a voice communication line of an NNI communication line.

86. (Original) A voice control unit as claimed in claim 85, wherein:

said voice control unit has an IP address used to transmit/receive a voice IP packet, and said IP address is supplied to set a media path communication table.

87. (Original) A voice control unit as claimed in Claim 85, wherein:

said voice control unit secures a logic voice communication line used to receive or transmit from the public switched telephone network.

88. (Previously Presented) A termination gateway equipped with a capsulation function wherein:

said termination gateway equipped with the encapsulation function includes a relay control unit and a network node apparatus;

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said network node apparatus owns both an IP encapsulation function and an inverse-capsulation function;

said relay control unit includes a telephone administration server, a telephone number server, a pilot telephone server, and a table administration server; and

among IP packets entered from a media router to the network node apparatus, a telephone call control IP packet is transferred to the relay control unit, and a voice IP packet is branched to a voice IP communication line.

89. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

a telephone communication between two telephone sets can be carried out via a telephone set 1, a public switched telephone network 1, an NNI interface communication line, both a relay gateway 1 and a relay gateway 2, which belong to an IP transfer network, an NNI interface communication line 2, a public switched telephone network, and a telephone set 2 in this order.

90. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

a telephone communication between two telephone sets can be carried out via a telephone set, a public switched telephone network 1, an NNI interface communication line, both a relay gateway and a gateway equipped with a capsulation function, which belong to an IP transfer network, a media router, and a telephone set 2 in this order.

91. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

a telephone communication between two telephone sets can be carried out via a telephone set 1, a media router, both a relay gateway and a gateway equipped with a non-capsulation function, which belong to an IP transfer network, an NNI interface communication line, a public switched telephone network, and a telephone set 2 in this order.

92. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 91 wherein:

based upon an address administration table contained in a non-capsulation type termination gateway, such an IP packet filtering operation is carried out, through which only an IP packet may pass into which a set of an IP address and a port number has been registered.

93. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 91 wherein:

based upon an address administration table contained in a non-capsulation type termination gateway, such an IP packet filtering operation is carried out, through which only an IP packet may pass into which a port number has been registered.

94. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

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a telephone communication can be carried out between two telephone sets via a telephone set 1, a media router 1, and both a termination gateway equipped with an encapsulation function and a relay gateway, which belong to an IP transfer network 1, and also

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via both another relay gateway and another termination gateway equipped with an encapsulation function, which belong to an IP transfer network 2, a media router 2, and a telephone set 2 in this order.

95. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

a telephone communication can be carried out between two telephone sets via a telephone set 1, a media router 1, and both a termination gateway equipped with a non-encapsulation function and a non-encapsulation relay gateway, which belong to an IP transfer network 1, and also via both another relay gateway and another termination gateway equipped with a non-encapsulation function, which belong to an IP transfer network 2, a media router 2, and a telephone set 2 in this order.

96. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network wherein:

in a case of inputting an IP packet receiving relay control section Y of IP transfer network Y from IP transfer network X which is operated by a communication company X to IP transfer network Y which is operated by a communication company Y;

when said IP packet is received, said relay control section Y inquires for a telephone number server and obtains an IP address of another relay control section Z of IP transfer network which relates to a connection for a receiver telephone number including in said IP packet; and

an IP packet set said obtained IP address is transferred to another relay control section Z.

97. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 9, wherein:

a network node apparatus has a first function to encapsulate an external IP packet and to form an internal IP packet and a second function to restore said external IP packet by decapsulating said internal IP packet;

said encapsulation and decapsulation are held as a record of an address administration table; and

address of a terminal is included in said address administration table.

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98. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 10, wherein:

a network node apparatus has a first function to encapsulate an external IP packet and to form an internal IP packet and a second function to restore said external IP packet by decapsulating said internal IP packet;

said encapsulation and decapsulation are held as a record of an address administration table; and

address of a terminal is included in said address administration table.

99. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 9, wherein:

information of multicast receiver provider and information multicast service buyer are received via user service server, thereby to utilize to set a multicast tree structure.

100. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, as claimed in Claim 9, wherein:

said multicast tree structure server inquires connection information and communication line cost due to said network node apparatus and a communication line between said routers to a resource administration server and obtains responses therefrom, and thereby to utilize to set said multicast tree structure.

101. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network, as claimed in Claim 9, wherein:

said multicast tree structure server notifies an address additional information for an address administration table inside said network node apparatus and an additional information for a path table inside said router to plural table administration server, and thereby to set said multicast tree structure.

102. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 9, wherein:

multicast communication record is set at said path tables of respective routers; and
an address administration table additional information and a path table additional information for tree structure set of multicast service are transferred from said tree structure server to a table administration server by utilizing said multicast communication record.

103. (Original) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in Claim 9, wherein:

a multicast proxy server individually communicates with a terminal connected to a network node apparatus; and
a high accuracy multicast is realized by sending multicast data.

104. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 9, wherein:

when an IP packet including a multicast IP packet as a receiver address is detected;
said IP packet is abandoned; and
thereby to exclude an IP packet concentration for the sender.

105. (Original) A network node apparatus as claimed in Claim 11, wherein:

an IP packet is transferred to an overflow communication line when an internal packet output designation in the communication record is not designated in IP capsulation.

106. (Original) A multicast cable voice broadcast communication system, wherein:

digitalized voice is transferred from a voice transmittance terminal and plural digitalized voice reception terminal receive said digitalized voice.

107. (Original) A cable TV communication system, wherein:

digitalized voice is transferred from a voice/moving image transmittance terminal and plural digitalized voice/moving image reception terminal receive said digitalized voice/moving image.

108. (Previously Presented) A multicast communication system with employment of an IP transfer network, wherein:

an IP transfer network has one network node apparatus or more,
said network node apparatus has a first function to form an internal packet by encapsulating an external IP packet inputting from said IP transfer network and a second function to restore to said external IP packet and output to outside by decapsulating said internal packet,

said internal packet is transferred in said IP transfer network passing one or more router having multicast function,

one or more terminal connected to said network node apparatus via IP communication line has peculiar external IP address and has one or more multicast IP address defined for respective multicast services,

multicast data sent from terminal of multicast sending side is transferred in said IP transfer network, and

said terminal is capable of receiving one or more multicast services by sending said multicast data to said terminal.

109. (Original) A multicast communication system with employment of an IP transfer network as claimed in Claim 108, wherein:

a terminal at receiving side optionally provides multicast IP address for respective multicast services by requesting to an IP transfer network operator, or cancels said multicast IP address.

110. (Original) A multicast communication system with employment of an IP transfer network as claimed in Claim 108, wherein one multicast service proxy server or more is connected to said network node apparatus.

111. (Original) A multicast communication system with employment of an IP transfer network as claimed in Claim 108, wherein:

a multicast service proxy server sends ACK packet intensive information, NACK packet intensive information and IP packet including intensive information of respective terminals to a carrying out the multicast service or to a sending work server; and

said ACK packet is received one terminal or more connected to said network node apparatus.

112. (Original) A multicast communication system with employment of an IP transfer network as claimed in Claim 108, wherein: a multicast service proxy server could communicate with a sending terminal or a sending work server which carries on the multicast service connected to said multicast service proxy server.

113. (Original) A multicast communication system with employment of an IP transfer network as claimed in Claim 108, wherein: a multicast service proxy server receives multicast data sent from an originating terminal and stores therein; and said multicast service proxy server sends said stored data to a terminal connected to said network node apparatus connecting with multicast service proxy server by using a multicast function of said network node apparatus.

114. (Original) A multicast communication system with employment of an IP transfer network as claimed in Claim 108, wherein: said multicast service proxy server could communicate with a specific terminal set communication code at said network node apparatus by transmitting/receiving said IP packet.

115. (Previously Presented) A multicast communication system with employment of an IP transfer network as claimed in Claim 108, wherein:

an internal IP packet is in communication code to designate a method for an IP-encapsulation and an IP-inverse-decapsulation;

when said internal IP packet output designating value is designated, said IP-encapsulation is carried out,

when said internal IP packet output designating value is not designated, said IP-encapsulation is not carried out and outputs an external IP packet to an external IP packet overflow communication line.

116. (Original) A multicast communication system with employment of an IP transfer network as claimed in Claim 115, wherein:

an overflow communication line server receives an external IP packet not being IP-encapsulated via said external IP packet overflow communication line, and transfers information included in said external IP packet to said multicast service proxy server via said network node apparatus.

117. (Original) A multicast communication system with employment of an IP transfer network as claimed in Claim 115, wherein:

an overflow communication line server receives an external IP packet not being IP-encapsulated via said external IP packet overflow communication line, and transfers information included in said external IP packet to said multicast service proxy server via a communication line connected to said overflow communication line server and said multicast service proxy server.

118. (Previously Presented) A network node apparatus, wherein;

an internal IP packet is in communication code to designate a method for an IP-encapsulation and an IP-inverse-decapsulation;

when said internal IP packet output designating value is designated, said IP-encapsulation is carried out,

when said internal IP packet output designating value is not designated, said IP-encapsulation is not carried out and outputs an external IP packet to an external IP packet overflow communication line.

119. (Previously Presented) A network node apparatus, wherein;

said network node apparatus has a first function to form an internal IP packet by IP-encapsulating an external IP packet and a second function to restore said external IP packet by decapsulating said internal IP packet;

an internal IP packet is in communication code to designate a method for an IP-encapsulation and an IP-decapsulation;

when said internal IP packet output designating value is designated, said IP-decapsulation is carried out, and

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when said internal IP packet output designating value is not designated, said IP-decapsulation is not carried out and outputs an external IP packet to an external IP packet overflow communication line.

120. (Original) A network node apparatus as claimed in Claim 118, wherein; further including an overflow IP packet selecting functional section to connect to said external IP packet overflow communication line.

121. (Original) A multicast communication system with employment of an IP transfer network, wherein:

sender multicast addresses are registered at an address administration table of a network node apparatus;
said IP packet is transferred when a sender multicast address in a header inputting to said network node apparatus is registered at said address administration table;
said IP packet is abandoned when said sender multicast address is not registered;
thereby to prevent that an unexpected IP packet intermixes with the IP transfer network.

122. (Previously Presented) A multicast communication system with employment of an IP transfer network, wherein:

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originating IP addresses are registered at an address administration table of a network node apparatus;
the IP packet inputted to said network node apparatus is transferred when an originating IP address in a header is registered at said address administration table;
said IP packet is abandoned when said originating IP address is not registered;
thereby to prevent that an unexpected IP packet intermixes with the IP transfer network.

123. (Original) A network node apparatus, wherein:

an IP packet is transferred when an IP address of a terminal is registered at an address administration table; and
when said IP address is not registered, that unexpected IP packet intermixes with the IP transfer network is prevented by transferring said IP packet to an overflow communication line.

124. (Previously Presented) A multicast communication system with employment of an IP transfer network, wherein:

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sender multicast addresses are registered at a network node apparatus path table;
the IP packet is transferred when a sender multicast address in a header of an external IP packet inputted to said network node apparatus is registered at said network node apparatus path table;
said IP packet is abandoned when said sender multicast address is not registered;
thereby to prevent that unexpected IP packet intermixes with the IP transfer network.

125. (Original) A network node apparatus, wherein:

sender multicast addresses are registered at a path table;
said IP packet is transferred when a sender multicast address in a header of an external IP packet inputting to said network node apparatus is registered at said path table;

said IP packet is abandoned when said sender multicast address is not registered;
thereby to prevent that unexpected IP packet intermixes with the IP transfer network.

126. (Original) A multicast communication system with employment of an IP transfer network as claimed in Claim 124, wherein:

a multicast service proxy server receives multicast data sent from a sender's terminal and stores it therein; and

said multicast service proxy server outputs said stored multicast data to a terminal connected to said network node apparatus connecting said multicast service proxy server by using a multicast function of said network node apparatus.

127. (Original) A multicast communication system with employment of an IP transfer network as claimed in Claim 124, wherein:

said multicast service proxy server sends an ACK packet intensive information received from one or more terminals connected to said network node apparatus, an IP packet including an NACK packet intensive information and an intensive information of individual terminal to a sending terminal carrying out a multicast service or to a sending work server.

128. (Previously Presented) A multicast communication system with employment of an IP transfer network as claimed in Claim 122, wherein:

said multicast service proxy server could communicate with a sending terminal carrying out a multicast service connected by said multicast service proxy server or with a sending work server by transmitting/receiving said IP packet.

129. (Previously Presented) A multicast communication system with employment of an IP transfer network as claimed in Claim 124, wherein:

said multicast service proxy server could communicate with a sending terminal carrying out a multicast service connected by said multicast service proxy server or with a sending work server by transmitting/receiving said IP packet.

130. (Previously Presented) A multicast communication system with employment of an IP transfer network as claimed in any one of Claims 124, wherein: said multicast service proxy server uses an information included in said IP packet received via said IP packet overflow communication line.

131. (Previously Presented) A cable voice broadcast communication system as claimed in Claim 122, wherein: said sending terminal sends digitalized voice, and plural receiving terminals receive said digitalized voice.

132. (Previously Presented) A cable voice broadcast communication system as claimed in Claim 131, wherein: said multicast proxy server intermediates an information exchange between the sending terminal and the receiving terminal.

133. (Previously Presented) A cable voice broadcast communication system as claimed in Claim 124, wherein: said sending terminal sends digitalized voice, and plural receiving terminals received said digitalized voice.

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134. (Previously Presented) A cable voice broadcast communication system as claimed in Claim 133, wherein: said multicast proxy server intermediates an information exchange between the sending terminal and the receiving terminal.

135. (Previously Presented) A cable TV broadcast communication system as claimed in Claim 122, wherein: said sending terminal sends digitalized voice/moving image, and plural receiving terminals receive said digitalized voice/moving image.

136. (Previously Presented) A cable TV broadcast communication system as claimed in Claim 135, wherein: said multicast proxy server intermediates an information exchange between the sending terminal and the receiving terminal.

137. (Previously Presented) A cable TV broadcast communication system as claimed in Claim 124, wherein: said sending terminal sends digitalized voice/moving image, and plural receiving terminals receive said digitalized voice/moving image.

138. (Previously Presented) A cable TV broadcast communication system as claimed in Claim 137, wherein: said multicast proxy server intermediates, an information exchange between the sending terminal and the receiving terminal.

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139. (Previously Presented) A multicast communication system with employment of an IP transfer network, wherein:
a terminal is connected to a router connecting an address administration module via a communication line;
a sender's IP address is registered at an address administration table of said address administration module;
said IP packet is transferred when said sender's address in a header of an IP packet inputting to said router is not registered at said address administration table;
said IP packet is abandoned when said sender's address is not registered;
thereby to prevent that an unexpected IP packet intermixes with an IP transfer network.

140. (Previously Presented) A multicast communication system with employment of an IP transfer network, wherein:
a terminal is connected to a router connecting an address administration module via a communication line;
a sender's IP address is registered at an address administration table of said address administration module;
said IP packet is transferred when said sender's address in a header of an IP packet inputting to said router is not registered at said address administration table;
said IP packet is transferred to an overflow communication line when said sender's address is not registered;
thereby to prevent that an unexpected IP packet intermixes with an IP transfer network.

141. (Previously Presented) A multicast communication system with employment of an IP transfer network, wherein:
an IP transfer network includes one or more routers;
said routers are connected to an IP communication line;

a terminal is connected to a router connecting an address administration module via a communication line;

an IP address is registered at an address administration table of said address administration module;

said IP packet is transferred when said sender's address in a header of an IP packet inputting to said router is not registered at said address administration table;

said IP packet is abandoned when said sender's address is not registered;

thereby to prevent that an unexpected IP packet intermixes with an IP transfer network.

142. (Previously Presented) A multicast communication system with employment of an IP transfer network, wherein:

a multicast service provider sends multicast data to a first sending work server operated by a communication company X and a second sending work server operated by a communication company Y;

said first sending work server sends said multicast data to plural terminals connected with a first IP transfer network operated by said communication company X; and

said second sending work server sends said multicast data to plural terminals connected with a second IP transfer network operated by said communication company Y.

143. (Previously Presented) A multicast communication system with employment of an IP transfer network as claimed in Claim 142, wherein:

said first sending work server collects sent results in said first IP transfer network via a multicast service proxy server so as to notify to said multicast service provider; and

said second sending work server collects sent results in said second IP transfer network via said multicast service proxy server so as to notify to said multicast service provider.

144. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

an IP transfer network contains two, or more connection servers, and a media router outside said IP transfer network is connected to a terminal having a transmittance/reception function of digital media;

a call setting IP packet is transmitted from said media router to the connection servers;

said connection server provided on the telephone calling side determines both a communication line for an inter-terminal communication within said IP transfer network and a circuit identification code for identifying said communication line by employing both a telephone number provided on the telephone calling side and a telephone number provided on the call reception side, and produces an initial address message containing said circuit identification code;

said produced initial address message is transmitted to the connection server provided on the call reception side via a relay connection server, said connection server on the call reception side transmits a call setting IP packet to the media router on the call reception side, and said media router on the call reception side transmits said call setting IP packet to the terminal on the call reception side;

said connection server on the call reception side produces an address completion;

said address completion message and transmits said received address completion message is transmitted to said connection server on the telephone calling side via said relay connection server;

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when a report of telephone calling operation is received from the terminal on the call reception side, said connection server on the call reception side produces a call pass message; said call pass message reaches via said relay connection server to said connection server on the telephone calling side; and said connection server on the calling side transmits the report of telephone calling operation of the terminal on the call reception side to the media router on the telephone calling side;

upon receipt of a response issued from the terminal on the call reception side, said connection server on the call reception side produces a response message; said response message reaches via said relay connection server to said connection server on the telephone calling side; said connection server on the telephone calling side stops the calling sound of the terminal on the call reception side; both said terminal on the telephone calling side and said terminal on the call reception side can establish an inter-terminal communication between the terminals to transmit/receive the digital media via said media routers provided on the telephone calling side and the call reception side;

a request for interrupting the inter-terminal communication is transmitted from said media router provided on either the telephone calling side or the call reception side to said connection server; a release request is sent from said connection server to both said relay connection server and another connection server; an interrupt instruction is transmitted from said another connection server to another media router, and on the other hand, a release completion is transmitted from another connection server via said relay connection server to said server; and an interrupt completion is sent to a media router so as to connect/release the inter-terminal communication between the two terminals.

145. (Previously Presented) A connection method for connecting PSTN with an IP network by using a common channel signaling system, wherein control lines for line connection and communication lines are separated in said IP network.

146. (Previously Presented) A network connection apparatus having a function to connect PSTN with an IP network by using a common channel signaling system, and having connection a control line interface and a communication line interface at side of said IP network.

147. (Previously Presented) An IP network, wherein control lines and communication lines for communications between terminals are logically separated inside of said IP network, said control lines and communication lines are connected to network node apparatus, line connection control between said terminals is carried out by using a common channel signaling system, through said network node apparatus.

148. (Previously Presented) An IP network as claimed in Claim 147, wherein said network nodes are connecting apparatus, said network nodes include connection control line interface and communication line interface at side of said IP network and said IP network has a function to connect PSTN with said IP network by using said common channel signaling method.

149. (Previously Presented) An IP transfer network wherein:

an external packet (including a source external address and a destination external address) which reaches a network node apparatus via an external communication line is added with a simple header under a management of an address management table in the network node

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apparatus, the internal packet comprises the simple header and the external packet, and the simple header includes at least a destination internal address;

the internal packet is transmitted from the network node apparatus, when the internal packet is transmitted from the network node apparatus, when the internal packet is transmitted via a relay, the internal address is referred by the relay, it is possible to transmit the internal packet via the relay and to transmit the internal packet without the relay, the internal packet is transferred through an IP transfer network to reach another network node apparatus, the external packet is recovered from the internal packet so as to be transferred to a communication line outside the IP transfer network; and

the external packet is converted into the internal packet only when a combination comprising a source internal address added to a logical terminal at the end of the communication line to which the external packet is inputted, a destination external address in the input external packet and a source external address are registered as a record of the address management table of the network node apparatus on the input side.

150. (Previously Presented) An IP transfer network as claimed in claim 149, wherein:
in place of the combination comprising three addresses, a combination comprising the source internal address and the destination external address in the input external packet is used.

151. (Previously Presented) An IP transfer network as claimed in claim 149 wherein:
the record of the address management table includes at least two records; a combination of the destination address and the internal address added to the logical terminal at the end of the communication line is changed depending on the records; and a destination of the internal packet can be changed by changing a destination external address in an external packet inputted from the same logical terminal is changed.

152. (Previously Presented) An IP transfer network as claimed in claim 149 wherein:
only when a result of logical and calculation of the destination address of the input external packet and a destination address mask inside the record in the address management table coincides with the destination address in the same record, the external packet is converted into the internal packet.

153. (Previously Presented) An IP transfer network as claimed in claim 149 wherein:
digitized voice data is transmitted and received from a telephone set 1 to a telephone set 2 via a media router 1, a communication line 1, a network node apparatus 1 in an IP transfer network, the inside of the IP transfer network, a network node apparatus 2 in the IP transfer network, a communication line 2 and a media router 2 so as to make it possible to perform the telephone communication.

154. (Previously Presented) An IP transfer network as claimed in claim 149 wherein:
digitized voice/image data is transmitted and received from a voice/image apparatus 1 to a voice/image apparatus 2 via a media router 1, a communication line 1, a network node apparatus 1 in an IP transfer network, the inside of the IP transfer network, a network node apparatus 2 in the IP transfer network, a communication line 2 and a media router 2 so as to make it possible to perform voice/image communication.

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155. (Previously Presented) A network node apparatus as claimed in claim 105, comprising a function of adding a simple header to an external packet to make an internal capsule and an inverted encapsulating function.

156. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

an IP transfer network contains two, or more connection servers and transmits a call setting from a terminal 1 of the out side to a connection server,

the connection server provided on the telephone calling side determines a communication line for inter-terminal communication within the IP transfer network by employing both a telephone number included in the call setting IP packet and provided on the telephone calling side and a telephone number provided on the call reception side, and produces an initial address message for setting telephone calling;

the produced initial address message is transmitted to the connection server on the call reception side via a relay connection server, and the connection server on the call reception side transmits a call setting to a terminal 2;

the connection server on the call reception side forms an address completion message and transmits the address completion message via the relay connection server;

upon receipt of a report of telephone calling operation issued from the terminal on the call reception side, the connection server on the call reception side forms a call pass message, the call pass message reaches the connection server on the telephone calling side via the relay connection server, and the connection server on the telephone calling side transmits the report of telephone calling operation of the terminal on the call reception side to the terminal 1 on the generation side;

upon receipt of a response issued from the terminal 2 on the call reception side, the connection server on the call reception side produces a response message, the response message reaches the connection server on the telephone calling side via the relay connection server, the connection server on the telephone calling side stops the calling sound of the terminal 2 on the call reception side, and both the terminal on the telephone calling side and the terminal on the call reception side can establish an inter-terminal communication between the terminals to transmit/receive a digital media; and

a request for interrupting the inter-terminal communication is transmitted from the terminal 1 or 2 provided on either the telephone calling side or the call reception side to one of the connection servers, a release request message is transmitted from the connection server to the connection server on another side via the relay connection server, an interrupt instruction is transmitted from the connection server on the other side to the connection server on another side, and on the other hand, a release completion message is transmitted from the connection server on the other side via the relay connection server to the server, and an interrupt completion is sent to the terminals so as to connect/release the inter-terminal communication between the two terminals.

157. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 1, wherein:

an initial address message, a call pass message, a response message, a release request message and a release completion message are transmitted/received between the connection server on the telephone calling side and the connection server on the call reception side; and an address completion message is omitted.

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158. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 149, wherein:

the initial address message contains a circuit identification code for identifying the communication line for inter-terminal communication.

159. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 158, wherein:

after the inter-terminal communication is completed, the connection server acquires an inter-terminal communication record including a circuit identification code, a communication time instant, and a telephone number, and records the acquired communication record therein so as to be used for a charging purpose and an operation/management.

160. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network as claimed in claim 149, wherein:

an initial address message, an address completion message, a call pass message, a response message, a release message and a release completion message are transmitted/received without passing through the relay connection server.

161. (Previously Presented) An IP transfer network as claimed in claim 149, wherein:

a terminal having a transmittance/reception function of digital media is any one of at least one telephone set, an IP terminal, a voice-moving image transmission/reception terminal and a facsimile terminal.

162. (Previously Presented) An IP transfer network wherein:

an integrated IP transfer network contains at least two sets of an IP data network, an IP telephone network, an IP voice/image network, a best effort network, an IP data multicast network, and IP base TV broadcast network and a network node apparatus; and a logical terminal of the network node apparatus is transferred to the outside of the integrated IP transfer network via a communication line.

163. (Previously Presented) An IP transfer network as claimed in claim 162, wherein:

the network node apparatus IP including an encapsulation function and an inverted encapsulating function.

164. (Previously Presented) An IP transfer network as claimed in claim 162, wherein:

the network node apparatus IP including a simple encapsulating function and a simple inverted encapsulating function.

165. (Previously Presented) An IP transfer network as claimed in claim 162, wherein:

an address of a terminal is included in the network node apparatus, and an external packet in which a source address in an external packet is registered is transferred without performing IP encapsulating and inverted encapsulating, and simple encapsulating and simple inverted encapsulating.

166. (Previously Presented) A terminal-to-terminal communication connection control method with employment of an IP transfer network, wherein:

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the IP transfer network includes at least two network node apparatuses, a media router is connected to any one of the network node apparatuses via an IP communication line, an internal address is added to a logical terminal at the end of the IP communication line on the network node apparatus side, the media router is connected to at least one telephone set through a communication line, the external IP address and the internal address are included as a record of an address management table inside the network node apparatus, an IP communication record for regulating a simple encapsulating method is set in advance, and connection control of telephone communication and a release control of telephone communication are performed by employing the IP communication record between the telephone set connected to the media router and another telephone set connected to another media router.

167. (Previously Presented) A method of acquiring an IP address with employment of a terminal-to-terminal communication connection method as claimed in claim 55, wherein:

a telephone number is converted into a domain name format of the telephone number, and an IP address used in telephone communication is acquired from the domain name format.

168. (Previously Presented) A terminal-to-terminal connection as claimed in claim 57, wherein:

a user makes an application for telephone service, the telephone service application information is set as an IP communication record of an address management table in a network node apparatus via at least a user service server and a telephone management server and used in telephone communication, and the telephone communication user can be requested to pay a communication charge for the telephone communication via at least the telephone management server and the user service server.

169. (Previously Presented) A method of acquiring an IP address with employment of a terminal-to-terminal communication connection method as claimed in claim 58, wherein:

a telephone number is converted into a domain name format of the telephone number, and an IP address used in telephone communication is acquired from the domain name format.

170. (Previously Presented) A terminal-to-terminal communication control method with employment of an IP transfer network as claimed in claim 91, wherein:

a terminal inside a gateway with a non-encapsulating function has a NAT function for converting an external address indicating a telephone management server in an IP packet into an internal address indicating a telephone management server.

171. (Previously Presented) A multicast communication system as claimed in claim 121, wherein:

the network node apparatus is separated into an address management module and a router.

172. (Previously Presented) A multicast communication system as claimed in claim 123, wherein:

the network node apparatus is separated into an address management module and a router.

173. (Previously Presented) A terminal-to-terminal communication connection control method as claimed in claim 9, wherein:

in IP encapsulating, when an internal packet output in the communication record is not designated, the IP packet is transferred to an overflow communication line.

174. (Previously Presented) An IP transfer network wherein:

an external IP packet is inputted from a logical terminal at an end of a communication line, when a combination comprising a logical terminal identification information on a transmission side, a destination external IP address inside the external IP packet and a source external IP address is determined, a communication line which transfers an internal packet between a network node apparatus on a transmission side and a network node apparatus on a reception side is determined, a simple header is added to the external IP packet to form an internal packet, and the simple header includes at least a destination internal address.

175. (Previously Presented) An IP transfer network as claimed in claim 149, wherein:
the internal packet is an optical frame.

176. (Previously Presented) A terminal-to-terminal communication control method with employment of an IP transfer network as claimed in claim 174, wherein:

in place of the combination comprising three addresses, a combination comprising the logical terminal identification information on the transmission side, the source internal address and the destination external address inside the external IP packet is used.

177. (Previously Presented) A network node apparatus used in an IP packet transfer network as claimed in claim 174.

178. (Previously Presented) A network node apparatus used in an IP packet transfer network as claimed in claim 182.

179. (Previously Presented) A terminal-to-terminal communication control method, wherein:

inter-terminal communication connection control for telephone communication constituted by an initial address message, an address completion message, a call pass message, and a response message is performed by transmitting/receiving an IP packet inside an IP transfer network to shift a voice communication phase, and the voice communication phase is completed through a step comprising a release request message and a release completion message by transmitting/receiving the IP packet.

180. (Previously Presented) A media router comprising:

a telephone number server which is asked about a telephone number to answer an IP address, and wherein the telephone number server is asked on the basis of a request of a calling telephone set to solve an IP address, a telephone call setting IP packet is formed by using the acquired IP address and transmitted to an IP transfer network to start a connection phase of telephone communication.

181. (Previously Presented) A network node apparatus as claimed in claim 118, comprising a function of adding a simple header to an external packet to make an internal capsule and an inverted encapsulating function.

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182. (Previously Presented) A network node apparatus as claimed in claim 119, comprising a function of adding a simple header to an external packet to make an internal capsule and an inverted encapsulating function.

183. (Previously Presented) A network node apparatus as claimed in claim 125, comprising a function of adding a simple header to an external packet to make an internal capsule and an inverted encapsulating function.

184. (Previously Presented) A multicast communication system as claimed in claim 125, wherein:
the network node apparatus is separated into an address management module and a router.

185. (Previously Presented) An IP transfer network as claimed in claim 174, wherein:
the internal packet is an optical frame.

186. (Previously Presented) An IP communication system, wherein:
an IP transfer network contains two or more server;
said server connects to a destination server via a line;
said server communicates with said destination server by transmitting/receiving an IP packet; and
said server carries out a terminal-to-terminal communication connection control by transmitting/receiving said IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system.

187. (Previously Presented) An IP communication system, wherein:
an IP transfer network contains two or more network node apparatus and servers;
said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network;
said network node apparatus include a function to form an internal IP packet by encapsulating an external IP packet and a function to restore said external IP packet by decapsulating said internal IP packet;
said network node apparatus connect to one or more media router;
said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet;
said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and
said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of H323 system based on a terminal-to-terminal communication connection control method of the H323 common channel signaling system.

188. (Previously Presented) An IP communication system, wherein:
an IP transfer network contains two or more network node apparatus and servers;

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said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network;

said network node apparatus include a function to form an internal IP packet by encapsulating an external IP packet and a function to restore said external IP packet by decapsulating said internal IP packet;

said network node apparatus connect to one or more media router;

said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet;

said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and

said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of SIP system based on a terminal-to-terminal communication connection control method of the SIP common channel signaling system.

189. (Previously Presented) An IP communication system, wherein:

an IP transfer network contains two or more network node apparatus and servers;

said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line; said network node apparatus include an IP address of a terminal connected to a media router; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving an IP packet; and said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said IP packet; and

said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system.

190. (Previously Presented) An IP communication system, wherein:

an IP transfer network contains two or more network node apparatus and servers;

said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network;

said network node apparatus include a function to form an internal IP packet by encapsulating an external IP packet and a function to restore said external IP packet by decapsulating said internal IP packet;

said network node apparatus connect to one or more media router;

said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet;

said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and

said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system.

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191. (Previously Presented) An IP communication system according to Claim 190, wherein: said connection server carries out a terminal-to-terminal communication connection control by transmitting/receiving said IP packet including call control data of SIP system based on a terminal-to-terminal communication connection control method of the SIP system.

192. (Previously Presented) An IP communication system according to Claim 186, wherein an address complete message is omitted.

193. (Previously Presented) An IP communication system according to Claim 186, wherein said media router transmits/receives an IP packet including call control data to/from said server via said network node apparatus.

194. (Previously Presented) An IP communication system according to Claim 186, wherein said media router transmits/receives an IP packet including digital voice data to/from said network node apparatus.

195. (Previously Presented) An IP communication system according to Claim 186, wherein said media router transmits/receives an IP packet including call control data of UNI system to/from said server based on communication connection control method of the UNI system.

196. (Previously Presented) An IP communication system according to Claim 186, wherein said media router transmits/receives an IP packet including call control data of H323 system to/from said server based on communication connection control method of the H323 system.

197. (Previously Presented) An IP communication system according to Claim 186, wherein said media router transmits/receives an IP packet including call control data of SIP system to/from said server based on communication connection control method of the SIP system.

198. (Previously Presented) An IP communication system according to Claim 186, wherein a terminal transmits/receives an IP packet including call control data of SIP system to/from said server via said media router and said network node apparatus based on communication connection control method of the SIP system.

199. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network can transmit/receive an IP packet including digital media between terminals when said IP transfer network makes a terminal-to-terminal communication connection control to a call phase.

200. (Previously Presented) An IP communication system according to Claim 186, wherein when said IP transfer network makes a terminal-to-terminal communication connection control to a call phase, said IP transfer network can transmit/receive an IP packet including digital media between terminals by using a communication line for terminal-to-terminal communication connection control specified by circuit identification code.

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201. (Previously Presented) An IP communication system according to Claim 199, wherein said digital media is digitalized voice and a media communication is a voice communication of telephone.

202. (Previously Presented) An IP communication system according to Claim 199, wherein said digital media includes at least one among character, digitalized still image, digitalized animation, digitalized voice and digitalized data and a media communication is an IP data communication.

203. (Previously Presented) An IP communication system according to Claim 199, wherein said digital media is digitalized animation and a media communication is a voice animation communication.

204. (Previously Presented) An IP communication system according to Claim 186, wherein a telephone number is a terminal discriminating number for discriminating a communication destination terminal.

205. (Previously Presented) An IP communication system according to Claim 186, wherein an IP address is used for discriminating a communication destination terminal.

206. (Previously Presented) An IP communication system according to Claim 186, wherein an operation management server collects communication records including line number, communication time, telephone number.

207. (Previously Presented) An IP communication system according to Claim 186, wherein said IP communication system includes a server to answer an IP address against a questioned telephone number.

208. (Previously Presented) An IP communication system according to Claim 186, wherein said IP communication system carries out a telephone connection phase by transmitting a call setting IP packet including at least an origin telephone number and a destination telephone number from a terminal.

209. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network converts a telephone number into an address of IP packet.

210. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving an IP packet including a digitalized voice data.

211. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving an IP packet including a telephone number.

212. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving an IP packet including a circuit identification code.

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213. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving an IP packet including a call control data.

214. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network records information including a telephone number and a circuit identification code when said IP transfer network carries out a terminal-to-terminal communication connection control.

215. (Previously Presented) An IP communication system according to Claim 186, wherein a terminal identification number at a time when said IP transfer network carries out a terminal-to-terminal communication connection control is a telephone number.

216. (Previously Presented) An IP communication system according to Claim 186, wherein a terminal identification number at a time when said IP transfer network carries out a terminal-to-terminal communication connection control is an IP address.

217. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network connects to one or more public switched telephone network via a gateway which is a relay signaling point of No.7 common channel signaling system.

218. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network connects to one or more public switched telephone network via a gateway which is a relay signaling point of No.7 common channel signaling system, and said IP transfer network carries out a communication connection control of terminals between a terminal connected to said IP transfer network and a terminal connected to one or more public switched telephone network based on a communication connection control method of the No.7 common channel signaling system.

219. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network connects to one or more public switched telephone network via a gateway which is a relay signaling point of No.7 common channel signaling system, and said IP transfer network exchanges a public switched telephone network for signaling information.

220. (Previously Presented) An IP communication system according to Claim 186, wherein a gateway contains one or more NNI interface, and said IP transfer network connects to one or more public switched telephone network via said gateway.

221. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network connects to one or more public switched telephone network via a gateway which is a relay signaling point of No.7 common channel signaling system, and said gateway contains point code.

222. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network connects to one or more public switched telephone network via a gateway which is a relay signaling point of No.7 common channel signaling system, and said IP transfer

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network exchanges said public switched telephone network for a telephone number via said gateway.

223. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network connects to one or more public switched telephone network via a gateway which is a relay signaling point of No.7 common channel signaling system, and said IP transfer network manages a communication record to said public switched telephone network by using a circuit identification code.

224. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network connects to one or more public switched telephone network via a gateway which is a relay signaling point of No.7 common channel signaling system, and said IP transfer network exchanges a connected public switched telephone network for an account information.

225. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network connects to one or more public switched telephone network via a gateway which is a relay signaling point of No.7 common channel signaling system, and an exchange of said public switched telephone network discriminates said gateway connected to said IP transfer network with a point code.

226. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network carries out a terminal-to-terminal connection control via a wireless transmitting/receiving portion connected to said network node apparatus via a gateway.

227. (Previously Presented) An IP communication system according to Claim 226, wherein a wireless transmitting/receiving portion transmits /receives an IP packet including a call control data of a wireless type.

228. (Previously Presented) An IP communication system according to Claim 226, wherein a wireless transmitting/receiving portion transmits /receives an IP packet including a voice data of a wireless type.

229. (Previously Presented) An IP communication system according to Claim 226, wherein a wireless transmitting/receiving portion transmits /receives an IP packet including a multi media data of a wireless type.

230. (Previously Presented) An IP communication system according to Claim 226, wherein a terminal transmits/receives an external IP packet including a call control data of No.7 common channel signaling system via said media router and said network node apparatus based on a terminal-to-terminal communication connection control method of a server in said IP transfer network and said No.7 common channel signaling system.

231. (Previously Presented) An IP communication system according to Claim 226, wherein a terminal transmits/receives an external IP packet including a call control data of UNI system via said media router and said network node apparatus based on a terminal-to-terminal communication connection control method of a server in said IP transfer network and said UNI system.

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232. (Previously Presented) An IP communication system according to Claim 226, wherein a terminal transmits/receives an external IP packet including a call control data of SIP system via said media router and said network node apparatus based on a terminal-to-terminal communication connection control method of a server in said IP transfer network and said SIP system.

233. (Previously Presented) An IP communication system according to Claim 226, wherein a telephone number is used as an discrimination number of a terminal.

234. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network carries out a terminal-to-terminal communication connection control to transmits/receives a multi media data for said network node apparatus via a wireless transmitting/receiving portion which is connected via a gateway.

235. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network carries out a terminal-to-terminal communication connection control to transmits/receives a digitalized voice data for said network node apparatus via a wireless transmitting/receiving portion which is connected via a gateway.

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236. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network carries out a terminal-to-terminal communication connection control to transmits/receives a call control data for said network node apparatus via a wireless transmitting/receiving portion which is connected via a gateway.

237. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network discards an applicable IP packet when an origin IP address is not registered at an address management table in said network node apparatus.

238. (Previously Presented) An IP communication system according to Claim 186, wherein said server has a circuit identification code including at least an origin telephone number, a destination telephone number and a circuit identification code, and said IP transfer network contains one or more server to register said origin telephone number, said destination telephone number and said circuit identification code.

239. (Previously Presented) An IP communication system according to Claim 186, wherein said IP communication system carries out a management of originating line numbers.

240. (Previously Presented) An IP communication system according to Claim 186, wherein said IP communication system carries out an account management.

241. (Previously Presented) An IP communication system according to Claim 186, wherein said IP communication system carries out a management of a communication record for respective telephone numbers.

242. (Previously Presented) An IP communication system according to Claim 186, wherein said IP transfer network is divided into a first communication line to transmit/receive an internal IP

packet including a call control data and a second communication line to transmit/receive an internal IP packet including a digitalized voice.

243. (Previously Presented) A gateway, which is used in an IP communication system wherein; an IP transfer network contains two or more network node apparatus and servers; said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network; said network node apparatus include a function to form an IP internal packet by encapsulating an IP external packet and a function to restore said external IP packet by decapsulating said internal IP packet; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet; said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system; and

wherein said gateway is connected to said IP transfer network and one or more public switched telephone network, and said gateway contains a relay control apparatus to carry out a communication connection control under a same rule to said public switched telephone network.

244. (Previously Presented) A gateway, which is used in an IP communication system wherein; an IP transfer network contains two or more network node apparatus and servers; said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network; said network node apparatus include a function to form an IP internal packet by encapsulating an IP external packet and a function to restore said external IP packet by decapsulating said internal IP packet; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet; said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system; and

wherein said gateway is connected to said IP transfer network and one or more public switched telephone network, and said gateway contains one or more NNI interface.

245. (Previously Presented) A gateway according to Claim 243, wherein said gateway exchanges said public switched telephone network for signaling information.

246. (Previously Presented) A gateway according to Claim 243, wherein said gateway includes a point code of said public switched telephone network.

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247. (Previously Presented) A gateway according to Claim 243, wherein a relay control portion exchanges said public switched telephone network for a telephone number.

248. (Previously Presented) A gateway according to Claim 243, wherein a relay control portion exchanges said public switched telephone network for a circuit identification code.

249. (Previously Presented) A gateway, which is used in an IP communication system wherein;
an IP transfer network contains two or more network node apparatus and servers; said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network; said network node apparatus include a function to form an IP internal packet by encapsulating an IP external packet and a function to restore said external IP packet by decapsulating said internal IP packet; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet; said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system; and

wherein said gateway includes a voice control portion to carry out a communication connection control under a same rule to said public switched telephone network, and said voice control portion exchanges said public switched telephone network for a voice.

250. (Previously Presented) A gateway, which is used in an IP communication system wherein;
an IP transfer network contains two or more network node apparatus and servers; said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network; said network node apparatus include a function to form an internal IP packet by encapsulating an external IP packet and a function to restore said external IP packet by decapsulating said internal IP packet; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet; said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system; and

wherein said gateway is connected to said IP transfer network and one or more public switched telephone network, and an exchange of said public switched telephone network discriminates a gateway connected to said IP transfer network by using a point code.

251. (Previously Presented) A gateway according to Claim 243, wherein said gateway includes an IP address.

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252. (Previously Presented) A server, which is used in an IP communication system wherein;
an IP transfer network contains two or more network node apparatus and servers; said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network; said network node apparatus include a function to form an internal IP packet by encapsulating an external IP packet and a function to restore said external IP packet by decapsulating said internal IP packet; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet; said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system; and
wherein said servers include a correspondence table of telephone numbers and IP addresses for converting into an address of IP packet based on a telephone number.

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253. (Previously Presented) A server, which is used in an IP communication system wherein;
an IP transfer network contains two or more network node apparatus and servers; said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network; said network node apparatus include a function to form an internal IP packet by encapsulating an external IP packet and a function to restore said external IP packet by decapsulating said internal IP packet; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet; said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system; and
wherein said servers collect and register a terminal-to-terminal communication record including telephone numbers and communication times when said IP transfer network carries out said terminal-to-terminal communication control.

254. (Previously Presented) A server, which is used in an IP communication system wherein;
an IP transfer network contains two or more network node apparatus and servers; said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network; said network node apparatus include a function to form an internal IP packet by encapsulating an external IP packet and a function to restore said external IP packet by decapsulating said internal IP packet; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet; said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal

IP packet in said IP transfer network; and said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system; and

wherein said servers collect and register a terminal-to-terminal communication record including host names of said terminals when said IP transfer network carries out said terminal-to-terminal communication control.

255. (Previously Presented) A network node apparatus, which is used in an IP communication system wherein;

an IP transfer network contains two or more network node apparatus and servers; said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network; said network node apparatus include a function to form an internal IP packet by encapsulating an external IP packet and a function to restore said external IP packet by decapsulating said internal IP packet; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet; said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system; and

wherein said network node apparatus includes a address management table when said IP transfer network carries out said terminal-to-terminal communication control.

256. (Previously Presented) A network node apparatus according to Claim 255, wherein origin IP addresses are registered at said address management table.

257. (Previously Presented) A network node apparatus, which is used in an IP communication system wherein;

an IP transfer network contains two or more network node apparatus and servers; said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network; said network node apparatus include a function to form an internal IP packet by encapsulating an external IP packet and a function to restore said external IP packet by decapsulating said internal IP packet; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet; said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system; and

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wherein said network node apparatus separates an external IP packet into a first internal packet including a call control data and a second internal IP packet including digital voice data and communicates by using separated communication lines.

258. (Previously Presented) A media router, which is used in an IP communication system wherein;

an IP transfer network contains two or more network node apparatus and servers; said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network; said network node apparatus include a function to form an internal IP packet by encapsulating an external IP packet and a function to restore said external IP packet by decapsulating said internal IP packet; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet; said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system; and

wherein said media router transmits/receives a call setting IP packet including at least an origin telephone number and a destination telephone number.

259. (Previously Presented) A media router according to Claim 258, wherein said call setting IP packet includes a call control data which communicates with said connection server.

260. (Previously Presented) A media router according to Claim 258, wherein said call setting IP packet includes a digitalized voice data which communicates with said IP transfer network.

261. (Previously Presented) A media router, which is used in an IP communication system wherein;

an IP transfer network contains two or more network node apparatus and servers; said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network; said network node apparatus include a function to form an internal IP packet by encapsulating an external IP packet and a function to restore said external IP packet by decapsulating said internal IP packet; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet; said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system; and

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wherein said media router obtains an IP packet by inquiring to said IP transfer network, forms a communication call setting IP packet by using said obtained IP packet and starts a communication connection phase by transmits said IP packet to said IP transfer network.

262. (Previously Presented) A terminal, which is used in an IP communication system wherein; an IP transfer network contains two or more network node apparatus and servers; said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network; said network node apparatus include a function to form an internal IP packet by encapsulating an external IP packet and a function to restore said external IP packet by decapsulating said internal IP packet; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet; said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system; and

wherein said terminal transmits/receives an IP packet including a call control data with a server in said IP transfer network via a media router and a network node apparatus.

263. (Previously Presented) A terminal according to Claim 262, wherein said IP packet includes a digital media.

264. (Previously Presented) A terminal according to Claim 263, wherein said digital media includes digitalized voice and/or animation.

265. (Previously Presented) A terminal according to Claim 262, wherein said terminal has a telephone number being terminal identification number or an IP packet being terminal address.

266. (Previously Presented) A terminal according to Claim 263, wherein said digital media includes at least characters, digitalized still images, digitalized animations, digitalized voice and digital data.

267. (Previously Presented) A terminal, which is used in an IP communication system wherein; an IP transfer network contains two or more network node apparatus and servers; said network node apparatus and servers connect to a destination network node apparatus and a destination server via a line in said IP transfer network; said network node apparatus include a function to form an internal IP packet by encapsulating an external IP packet and a function to restore said external IP packet by decapsulating said internal IP packet; said network node apparatus connect to one or more media router; said media router connects to one or more terminal and communicate with said network node apparatus by transmitting/receiving said external IP packet; said network node apparatus and said servers communicate with said destination network node apparatus and destination server by transmitting/receiving said internal IP packet in said IP transfer network; and said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet

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including call control data of No.7 common channel signaling system based on a terminal-to-terminal communication connection control method of the No.7 common channel signaling system; and

wherein said terminal transmits an IP packet including a destination telephone number to said IP transfer network, said IP transfer network converts said IP packet into a destination IP address corresponding to said destination telephone number, and said terminal transmits said IP packet including said destination IP address to said terminal.

268. (Previously Presented) An IP communication system, wherein:

an IP transfer network contains three or more network node apparatus;

said network node apparatus include a function to form an internal IP packet by encapsulating an IP external packet and a function to restore said external IP packet by decapsulating said internal IP packet;

said network node apparatus connect to two or more destination network node apparatuses through a line via a router having multicast path table;

said network node apparatus connects to one or more media router outside of said IP transfer network;

said network node apparatus connects to one or more terminal;

said media router connects to one or more terminal;

said media router communicates with said network node apparatus by transmitting/receiving said external IP packet;

said network node apparatus communicates with a destination network node apparatus by transmitting/receiving said internal IP packet within said IP transfer network; and

said IP transfer network carries out a terminal-to-terminal communication connection control by transmitting/receiving said internal IP packet under a multicast communication control method.

269. (Previously Presented) An IP communication system according to Claim 268, wherein said network node apparatus discards an applicable IP packet when an origin IP address of said external IP packet of a multicast transmitter is not registered at an address management table of said network node apparatus.

270. (Previously Presented) An IP communication system according to Claim 268, wherein said IP transfer network transmits/receives said internal IP packet including a multimedia data and carries out a terminal-to-terminal communication connection control.

271. (Previously Presented) An IP communication system according to Claim 268, wherein said IP transfer network has a tree structure server for forming a multicast tree.

272. (Previously Presented) An IP communication system according to Claim 271, wherein said tree structure server transfers a path table adding information to a table management server.

273. (Previously Presented) An IP communication system according to Claim 268, wherein said network node apparatus discards an applicable IP packet when a destination IP address of said external IP packet of a multicast transmitter is not registered at an address management table of said network node apparatus.

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274. (Previously Presented) An IP communication system according to Claim 268, wherein said IP transfer network carries out an electronic newspaper delivery service by transmitting/receiving said internal IP packet including an electronic paper as digital information.

275. (Previously Presented) An IP communication system according to Claim 268, wherein said IP transfer network carries out a voice broadcast service by transmitting/receiving said internal IP packet including voice as digital information.

276. (Previously Presented) An IP communication system according to Claim 268, wherein said IP transfer network carries out a TV broadcast service by transmitting/receiving said internal IP packet including voice and animation as digital information.

277. (Previously Presented) An IP communication system according to Claim 268, wherein said IP transfer network transmits/receives said IP packet including voice, image or animation to said network apparatus via a wireless transmitting/receiving portion connected by gateways and carries out a terminal-to-terminal communication connection control, and said IP transfer network carries out a multimedia service.

278. (Previously Presented) An IP communication system according to Claim 268, wherein said terminal has a telephone number being terminal identification number or an IP packet being terminal address.

279. (Previously Presented) An IP communication system, wherein:
 an IP transfer network contains two or more network node apparatuses and servers;
 said network node apparatus include a function to form an internal IP packet by encapsulating an IP external packet and a function to restore said external IP packet by decapsulating said internal IP packet;
 said network node apparatus and said servers are connected within IP transfer network via a line;
 said network node apparatus is connected to one or more media router;
 said media router connects to one or more terminal;
 said media router connects to one or more terminal;
 said media router communicates with said network node apparatus by transmitting/receiving said external IP packet;
 said network node apparatus and servers communicate with a destination network node apparatus and a destination server by transmitting/receiving said internal IP packet within said IP transfer network; and
 said IP communication system includes one or more said IP transfer network and constitutes an integrated IP communication system.

280. (Previously Presented) An IP communication system according to Claim 279, wherein integrated IP communication system includes an IP transfer network to carry out a telephone communication.

281. (Previously Presented) An IP communication system according to Claim 279, wherein integrated IP communication system includes an IP transfer network to carry out an IP data multicast communication

282. (Previously Presented) An IP data multicast operation management server in used in said IP communication system according to Claim 279, wherein said IP data multicast operation management server manages IP multicast communication data of a terminal host name and so on of an IP data multicast network.

283. (Previously Presented) An IP base TV broadcast operation service management server in used in said IP communication system according to Claim 279, wherein said IP base TV broadcast operation service management server manages IP base TV communication data of a terminal host name and so on of an IP base TV broadcast network.

284. (Previously Presented) An IP communication system according to Claim 279, wherein said network node apparatus connects to two or more IP transfer network.

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285. (Previously Presented) A communication method of terminal carried out in said IP communication system according to Claim 186, wherein said terminal transmits an IP packet including a destination telephone number to said IP transfer network, said IP transfer network converts said IP packet into a destination IP address corresponding to said destination telephone number and transmits an IP packet including a corresponding IP address, and said terminal receives a transmitted IP packet.

286. (New) An IP transfer network, wherein an internal packet is formed based on a logical terminal on sending side and an external packet, a logical terminal on receiving side is decided based on a logical terminal discrimination information on said formed internal packet, and a terminal is connected to said logical terminal on sending side or said terminal on receiving side via a communication line,

whereby a terminal-to-terminal communication connection control is carried out by internal packets including a call control.

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287. (New) An IP transfer network, wherein there is provided two or more network node apparatus, said network node apparatus includes two or more logical terminals, a network node apparatus on sending side forms an internal packet based on a logical terminal on sending side and an external packet, a network node apparatus on receiving side decides a logical terminal to be received based on a logical terminal discrimination information of said received internal packet, and a terminal is connected with said logical terminal on sending side or said logical terminal on receiving side via a communication line,

whereby a terminal-to-terminal communication connection control is carried out by internal packets including a call control.

288. (New) An IP transfer network, wherein there is provided two or more network node apparatus, an external packet is converted into an internal packet at a network node apparatus on sending side, said external packet is restored at a network node apparatus on receiving side, a communication with said internal packet is carried out at inter-network node apparatus, and a terminal is connected with said network node apparatus on sending side or said network node

apparatus on receiving side via a communication line,

whereby a terminal-to-terminal communication connection control is carried out by internal packets including a call control.

289. (New) An IP transfer network, wherein there is provided two or more network node apparatus, said network node apparatus includes two or more logical terminals, an external packet is converted into an internal packet at a logical terminal on sending side, said external packet is restored at a network node apparatus on receiving side, a communication with said internal packet is carried out at inter-network node apparatus, and a terminal is connected with said logical terminal on sending side or said logical terminal on receiving side via a communication line,

whereby a terminal-to-terminal communication connection control is carried out by internal packets including a call control.

290. (New) An IP transfer network, wherein there is provided two or more network node apparatus, said network node apparatus includes two or more communication lines, a logical terminal is defined for each communication line, a network node apparatus on sending side forms an internal packet from an external packet for each logical terminal on sending side, a network node apparatus on receiving side restores said external packet from said internal packet for each logical terminal on receiving side, and a terminal is connected to said logical terminal on sending side or said logical terminal on receiving side via a communication line,

whereby a terminal-to-terminal communication connection control is carried out by internal packets including a call control.

291. (New) A network node apparatus, wherein said network node apparatus includes two or more logical terminals, an internal packet is formed based on a logical terminal and an external packet, said network node apparatus has a function to decide a logical terminal on receiving side based on logical terminal discrimination information of said formed internal packet, and said internal packet includes a call control.

292. (New) A network node apparatus, wherein said network node apparatus includes two or more logical terminals, a network node apparatus forms an internal packet based on a logical terminal on sending side and an external packet, a network node apparatus on receiving side has a function to decide a logical terminal to be received based on logical terminal discrimination information of said formed internal packet, and said internal packet includes a call control.

293. (New) A network node apparatus, wherein an IP transfer network includes two or more network node apparatus, an external packet is converted into an internal packet at a network node apparatus on sending side, said internal packet is restored to said external packet at a network node apparatus on receiving side, a communication with said internal packet is carried out at inter-network node apparatus, and a terminal is connected with said logical terminal on sending side or said logical terminal on receiving side via a communication line,

whereby a terminal-to-terminal communication connection control is carried out by internal packets including a call control.

294. (New) A network node apparatus, wherein an IP transfer network includes two or more network node apparatus, said network node apparatus includes two or more logical terminals, an

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external packet is converted into an internal packet at a network node apparatus on sending side, said internal packet is restored to said external packet at a network node apparatus on receiving side, a communication with said internal packet is carried out at inter-network node apparatus, and a terminal is connected to said logical terminal on sending side or said logical terminal on receiving side via a communication line,

whereby a terminal-to-terminal communication connection control is carried out by internal packets including logical terminal discrimination information on receiving side and a call control.

295. (New) A network node apparatus, wherein said network node apparatus includes two or more communication lines, a logical terminal is defined for each communication line, a network node apparatus on sending side forms an internal packet from an external packet for each logical terminal on sending side, a network node apparatus on receiving side restores said external packet from said internal packet for each logical terminal on receiving side, and a communication at inter-network node apparatus is carried out by internal packets including a call control.

296. (New) A network node apparatus according to Claim 291, wherein said internal packet includes a telephone number.

297. (New) A network node apparatus according to Claim 291, wherein said internal packet includes a call control of a common channel signaling system.

298. (New) A network node apparatus according to Claim 291, wherein said internal packet includes a call control of an SIP system.

299. (New) An IP transfer network according to Claim 286, wherein said internal packet includes a call control of a common channel signaling system.

300. (New) An IP transfer network according to Claim 286, wherein said internal packet includes a call control of an SIP system.

301. (New) An IP transfer network according to Claim 286, wherein said internal packet includes a telephone number.

302. (New) An IP transfer network according to Claim 286 connecting with a public switched telephone network.

303. (New) An IP transfer network according to Claim 286, wherein said terminal is a telephone machine.

304. (New) An IP transfer network according to Claim 286, wherein said terminal includes a wireless interface function.

305. (New) An IP transfer network according to Claim 286, wherein said IP transfer network is connected with a media router, and sends/receives an IP packet including said media router and a call control.

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306. (New) An IP transfer network according to Claim 286, wherein said IP transfer network is connected with a media router, and sends/receives an IP packet including said media router and a call control of a UNI system.

307. (New) An IP transfer network according to Claim 286, wherein said IP transfer network is connected with a media router, and sends/receives an IP packet including said media router and a call control of an SIP system.

308. (New) An IP transfer network according to Claim 286, wherein a telephone number is used for discriminating a terminal.

309. (New) An IP transfer network according to Claim 286, wherein an IP packet including a digital media is sent/received at inter-terminal when a terminal-to-terminal communication connection control is a voice communication phase.

310. (New) An IP transfer network according to Claim 286, wherein an IP address is formed based on a telephone number.

311. (New) An IP transfer network according to Claim 286, wherein said IP transfer network is connected with one or more public switched telephone networks via a gateway.

312. (New) An IP transfer network according to Claim 286, wherein said IP transfer network is connected with a public switched telephone network via a gateway which is a signaling point of said public switched telephone network.

313. (New) An IP transfer network according to Claim 286, wherein a wireless sending/receiving portion is connected with said IP transfer network, and said wireless sending/receiving portion sends/receives a call control of wireless system.

314. (New) An IP transfer network according to Claim 286, wherein a wireless sending/receiving portion is connected with said IP transfer network, and said wireless sending/receiving portion sends/receives a telephone number.

315. (New) An IP transfer network according to Claim 286, wherein a wireless sending/receiving portion is connected with said IP transfer network, and said wireless sending/receiving portion sends/receives a voice.

316. (New) An IP transfer network according to Claim 286, wherein a wireless sending/receiving portion is connected with said IP transfer network, and said wireless sending/receiving portion sends/receives a digital media.

317. (New) An IP transfer network according to Claim 286, wherein a communication line for sending/receiving an internal packet including a call control is separated from a communication line for sending/receiving an internal packet including a voice.

318. (New) A gateway, wherein said gateway is connected with an IP transfer network and a

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public switched telephone network, and said gateway includes a signaling point function for carrying out a communication connection control under a same rule with said public switched telephone network.

319. (New) An IP transfer network according to Claim 310, which includes a correspondence information on telephone numbers and IP addresses.

320. (New) A terminal, wherein an external packet including a destination telephone number is sent to an IP transfer network, said IP transfer network forms a destination IP address corresponding to said destination telephone number and replies said destination IP address to said terminal.

321. (New) A terminal according to Claim 320, wherein a terminal discrimination number is processed as a telephone number or an IP address.

322. (New) An IP transfer network, wherein an internal packet is formed based on a logical terminal on sending side and an external packet, a logical terminal on receiving side is decided based on a logical terminal discrimination information of said formed internal packet, a terminal is connected with said logical terminal on sending side or said logical terminal on receiving side via a communication line, and a terminal-to-terminal communication connection control is carried out by using an internal packet including an address for multicast.

323. (New) An IP transfer network, wherein a network node apparatus includes two or more logical terminals, a network node apparatus on sending side forms an internal packet based on a logical terminal on sending side and an external packet, a network node apparatus on receiving side decides a logical terminal at which said internal packet arrives based on a logical terminal discrimination information of said received internal packet, a terminal is connected with said logical terminal on sending side or said logical terminal on receiving side via a communication line, and a terminal-to-terminal communication connection control is carried out by using an internal packet including an address for multicast.

324. (New) An IP transfer network, wherein said IP transfer network includes three or more network node apparatus, an external packet is converted into an internal packet at a network node apparatus on sending side, said internal packet is converted into said external packet at a network node apparatus on receiving side, a communication with said internal packet is carried out at inter-network node apparatus, a terminal is connected with said network node apparatus on sending side or said network node apparatus on receiving side via a communication line, and a terminal-to-terminal communication connection control is carried out by using an internal packet including an address for multicast.

325. (New) An IP transfer network, wherein said IP transfer network includes three or more network node apparatus, said network node apparatus includes two or more logical terminals, an external packet is converted into an internal packet at a network node apparatus on sending side, said internal packet is converted into said external packet at a network node apparatus on receiving side, a communication with said internal packet is carried out at inter-network node apparatus, a terminal is connected with said network node apparatus on sending side or said network node apparatus on receiving side via a communication line, and a terminal-to-terminal

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communication connection control is carried out by using an internal packet including a logical terminal discrimination information on receiving side and an address for multicast.

326. (New) A network node apparatus, wherein said network node apparatus includes two or more logical terminals, forms an internal packet based on a logical terminal on sending side and an IP external packet and decides a logical terminal on receiving side based on a logical terminal discrimination information of said received internal packet, a terminal is connected with said logical terminal on sending side or said logical terminal on receiving side via a communication line, and a terminal-to-terminal communication connection control is carried out by using an internal packet including an address for multicast.

327. (New) A network node apparatus, wherein said network node apparatus includes two or more logical terminals, a network node apparatus on receiving side forms an internal packet based on a logical terminal on sending side and an external packet, a network node apparatus on receiving side decides a logical terminal at which said internal packet arrives based on a logical terminal discrimination information of said received internal packet, a terminal is connected with said logical terminal on sending side or said logical terminal on receiving side via a communication line, and a terminal-to-terminal communication connection control is carried out by using an internal packet including an address for multicast.

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328. (New) A network node apparatus, wherein an IP transfer network includes three or more network node apparatus, an external packet is converted into an internal packet at a network node apparatus on sending side, said internal packet is converted into said internal packet at a network node apparatus on receiving side, a communication with said internal packet is carried out at inter-network node apparatus, a terminal is connected with said network node apparatus on sending side or said network node apparatus on receiving side via a communication line, and a terminal-to-terminal communication connection control is carried out by using an internal packet including an address for multicast.

329. (New) A network node apparatus, wherein an IP transfer network includes three or more network node apparatus, an external packet is converted into an internal packet at a network node apparatus on sending side, said internal packet is converted into said external packet at a network node apparatus on receiving side, a communication with said internal packet is carried out at inter-network node apparatus, said network node apparatus includes two or more logical terminals, a terminal is connected with said network node apparatus on sending side or said network node apparatus on receiving side via a communication line, and a terminal-to-terminal communication connection control is carried out by using an internal packet including a logical terminal discrimination information on receiving side and an address for multicast.

330. (New) An IP transfer network according to Claim 322, wherein said internal packet includes a voice.

331. (New) An IP transfer network according to Claim 322, wherein said internal packet includes an electronic newspaper.

332. (New) An IP transfer network according to Claim 322, wherein said internal packet includes a moving picture.

333. (New) An IP transfer network according to Claim 322, wherein said internal packet includes a digital information.

334. (New) A communication method in an IP transfer network, wherein an internal packet is formed based on a logical terminal on sending side and an external packet, a logical terminal on receiving side is decided based on a logical terminal discrimination information on said formed internal packet, and a terminal is connected with said logical terminal on sending side or said logical terminal on receiving side via a communication line, thereby a terminal-to-terminal communication connection control is carried out by internal packets including a call control, and wherein said terminal sends said external packet including a destination telephone number to said IP transfer network, said IP transfer network forms a destination IP address for sending corresponding to a destination telephone number and replies it to said terminal, and said terminal communicates with a destination terminal by using said destination IP address for sending and a self IP address.

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335. (New) A terminal including a wireless interface, and having a function to be connected with an IP transfer network, wherein an internal packet is formed based on a logical terminal on sending side and an external packet, a logical terminal on receiving side is decided based on a logical terminal discrimination information on said formed internal packet, and a terminal is connected with said logical terminal on sending side or said logical terminal on receiving side via a communication line, whereby a terminal-to-terminal communication connection control is carried out by internal packets including call control.

336. (New) A terminal included in an IP transfer network, wherein said IP transfer network forms an internal packet based on a logical terminal on sending side and an external packet, decides a logical terminal on receiving side based on a logical terminal discrimination information of said formed internal packet, and said IP transfer network is connected with said logical terminal on sending side or said logical terminal on receiving side via a wireless sending/receiving portion and a communication line and includes a wireless interface.

337. (New) A terminal included in an IP transfer network, wherein said IP transfer network includes two or more network node apparatus, said network node apparatus two or more logical terminals, a network node apparatus forms an internal packet based on a logical terminal on sending side and an external packet, a network node apparatus on receiving side decides a logical terminal to be arrived based on a logical terminal discrimination information of said formed internal packet, and said IP transfer network is connected with said logical terminal on sending side or said logical terminal on receiving side via a wireless sending/receiving portion and a communication line and includes a wireless interface.

338. (New) A terminal included in an IP transfer network, wherein said IP transfer network includes two or more network node apparatus, an external packet is converted into an internal packet at a network node apparatus on sending side, said external packet is restored from said internal packet at a network node apparatus on sending side, a communication with said internal packet including a logical terminal discrimination information is carried out at inter-network node apparatus, and said IP transfer network is connected with said logical terminal on sending side or said logical terminal on receiving side via a wireless sending/receiving portion and a

communication line and includes a wireless interface.

339. (New) A terminal included in an IP transfer network, wherein said IP transfer network includes two or more network node apparatus, said network node apparatus includes two or more communication lines, a logical terminal is defined for each communication line, a network node apparatus on sending side forms an internal packet from an external packet for each logical terminal on sending side, a network node apparatus on receiving side restores said external packet from said internal packet for each logical terminal on receiving side, and said IP transfer network is connected with said logical terminal on sending side or said logical terminal on receiving side via a wireless sending/receiving portion and a communication line and includes a wireless interface.

340. (New) An IP transfer network, wherein there is provided two or more network node apparatus, an external packet is converted into an internal packet at a network node apparatus on sending side, said external packet is restored at a network node apparatus on receiving side, a communication with said internal packet is carried out at inter-network node apparatus, a terminal is connected with said logical terminal on sending side or said logical terminal on receiving side, a terminal-to-terminal communication connection control is carried out by internal packets including a logical terminal discrimination information on receiving side and a call control, an IP address of an IP terminal is registered at said network node apparatus, and said network node apparatus discards said IP packet when it received an IP packet including a non-registered source IP address.

341. (New) A network node apparatus included in an IP transfer network, wherein there is provided two or more network node apparatus, an external packet is converted into an internal packet at a network node apparatus on sending side, said external packet is restored at a network node apparatus on receiving side,

said network node apparatus has functions that a communication with said internal packet is carried out at inter-network node apparatus, and a terminal-to-terminal communication connection control is carried out by internal packets including a logical terminal discrimination information on receiving side and a call control, and

a terminal is connected with said logical terminal on sending side or said logical terminal on receiving side, an IP address of an IP terminal is registered at said network node apparatus, and said network node apparatus discards said IP packet when it received an IP packet including a non-registered source IP address.

342. (New) An IP transfer network according to Claim 286, wherein an IP address of an IP terminal is registered at said network node apparatus, and said network node apparatus discards said IP packet when it received an IP packet including a non-registered source IP address.

343. (New) A network node apparatus according to Claim 326, wherein an IP address of an IP terminal is registered at said network node apparatus, and said network node apparatus discards said IP packet when it receives an IP packet including a non-registered source IP address.

344. (New) A terminal included in an IP transfer network, wherein in said IP transfer network, an internal packet is formed based on a logical terminal on sending side and an external packet, a logical terminal on receiving side is decided based on a logical terminal discrimination

information on said formed internal packet, and a terminal is connected with said logical terminal on sending side or said logical terminal on receiving side via a communication line, whereby a terminal-to-terminal communication connection control is carried out by internal packets including call control, and

an IP address of said terminal is registered at said network node apparatus, and said network node apparatus discards said IP packet when it receives an IP packet including a non-registered source IP address.

345. (New) An IP transfer network according to Claim 286, wherein an IP address of said IP terminal is registered at said network node apparatus, and said network node apparatus discards said IP packet when it receives an IP packet including a non-registered source IP address.

346. (New) An IP transfer network, wherein said IP transfer network is connected with a public switched telephone network via a gateway, and a communication connection control between a terminal and a telephone machine is carried out by using an IP packet including a call control when a communication between a terminal to be connected and a telephone machine connected with a public switched telephone network is carried out.

347. (New) An IP transfer network, wherein said IP transfer network is connected with a public switched telephone network via a gateway, and a communication connection control between a terminal and a telephone machine is carried out by using an IP packet including a call control of an SIP system when a communication between a terminal to be connected and a telephone machine connected with a public switched telephone network is carried out.

348. (New) An IP transfer network, wherein said IP transfer network is connected with a public switched telephone network via a gateway, and a communication connection control between a terminal and a telephone machine is carried out by using an IP packet including a call control of a common channel signaling system when a communication between a terminal to be connected and a telephone machine connected with a public switched telephone network is carried out.

349. (New) An IP transfer network, wherein said IP transfer network includes a function to form an IP address of a terminal based on a telephone number and is connected with a public switched telephone network via a gateway, and a communication connection control between a terminal and a telephone machine is carried out by using an IP packet including a call control when a communication between a terminal to be connected and a telephone machine connected with a public switched telephone network is carried out.

350. (New) An IP transfer network, wherein two or more terminals are connected with said IP transfer network, said IP transfer network forms an IP address of said terminal based on a telephone number and carries out a terminal-to-terminal communication connection control to connect by using an IP packet including a call control.

351. (New) An IP transfer network, wherein two or more terminals are connected with said IP transfer network, said IP transfer network forms an IP address based on a telephone number and carries out a terminal-to-terminal communication connection control to connect by using an IP packet including a call control and a voice.

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352. (New) An IP transfer network, wherein two or more terminals are connected with said IP transfer network, said IP transfer network carries out a terminal-to-terminal communication connection control to connect by using an IP packet including a call control.

353. (New) An IP transfer network, wherein two or more terminals are connected with said IP transfer network, said IP transfer network carries out a terminal-to-terminal communication connection control to connect by using an IP packet including a call control of a common channel signaling system.

354. (New) An IP transfer network, wherein two or more terminals are connected with said IP transfer network, said IP transfer network carries out a terminal-to-terminal communication connection control to connect by using an IP packet including a call control of an SIP system.

355. (New) An IP transfer network, wherein two or more terminals are connected with said IP transfer network, said IP transfer network carries out a terminal-to-terminal communication connection control to connect by using an IP packet including a call control of an H323 system.

356. (New) An IP transfer network, wherein there is provided two or more network node apparatus, said network node apparatus are connected with terminals, IP address of said terminals are registered at said network node apparatus, said network node apparatus discard said IP packet when it receives said IP packet including non-registered source, and a terminal-to-terminal communication connection control is carried out by using an IP packet including a call control.

357. (New) An IP transfer network, wherein two or more terminals are connected with said IP transfer network, said IP transfer network includes functions to form an IP address based on a telephone number, to carry out a terminal-to-terminal communication connection control by using an IP packet including a call control, and to connect with an IP transfer network of a different company.

358. (New) A terminal, wherein said terminal is connected with an IP transfer network, said IP transfer network carries out a terminal-to-terminal communication connection control by using an IP packet including a call control, said terminal sends an IP packet including a telephone number of a destination terminal to said IP transfer network, said IP transfer network forms an IP address of said destination terminal based on said sent telephone number and replies it to said terminal, and said terminal communicates with said destination terminal by using said IP address of said destination terminal and self IP address.

359. (New) A terminal which is connected with an IP transfer network, wherein said IP transfer network is connected with a public switched telephone network via a gateway, and a communication connection control between a terminal and a telephone machine is carried out by using an IP packet including a call control when a communication between a terminal to be connected and a telephone machine connected with a public switched telephone network is carried out.

360. (New) An IP transfer network, wherein said IP transfer network is connected with a public switched telephone network via a gateway and includes a wireless interface, and a

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communication connection control between a terminal and a telephone machine is carried out by using an IP packet including a call control when a communication between a terminal to be connected and a telephone machine connected with a public switched telephone network is carried out

361. (New) A communication method of a terminal, wherein said terminal is connected with an IP transfer network, said IP transfer network carries out a terminal-to-terminal communication connection control by using an IP packet including a call control, said terminal sends an IP packet including a telephone number of a destination terminal to said IP transfer network, said IP transfer network forms an IP address of said destination terminal based on said sent telephone number and replies it to said terminal, and said terminal communicates with said destination terminal by using said IP address of said destination terminal and self IP address.

362. (New) An IP transfer network, wherein said IP transfer network includes two or more network node apparatus, said network node apparatus are connected with terminals, a terminal-to-terminal communication connection control is carried out by using an IP packet including a call control, an external packet is converted into an internal packet when a sender address of said external packet is included in a sender address of said external packet held in a network node apparatus on sending side, said internal packet is restored to said external packet at a network node apparatus on receiving side, and a communication with said internal packet is carried out at inter-network node apparatus.

363. (New) An IP transfer network, wherein said IP transfer network includes two or more network node apparatus, said network node apparatus are connected with terminals, a terminal-to-terminal communication connection control is carried out by using an IP packet including a call control, an external packet is converted into an internal packet when a destination address of said external packet is included in a destination address of said external packet held in a network node apparatus on sending side, said internal packet is restored to said external packet at a network node apparatus on receiving side, and a communication with said internal packet is carried out at inter-network node apparatus.

364. (New) An IP transfer network, wherein said IP transfer network includes two or more network node apparatus, said network node apparatus are connected with terminals, a terminal-to-terminal communication connection control is carried out by using an IP packet including a call control, an external packet is converted into an internal packet at a network node apparatus on sending side, a communication with said internal packet is carried out at inter-network node apparatus, said internal packet is restored to said external packet when a sender address of said external packet including in said internal packet received at a network node apparatus on receiving side is included in a sender address of said external packet registered in a network node apparatus on receiving side.

365. (New) An IP transfer network, wherein said IP transfer network includes two or more network node apparatus, a terminal-to-terminal communication connection control is carried out by using an IP packet including a call control, an external packet is converted into an internal packet at a network node apparatus on sending side, a communication with said internal packet is carried out at inter-network node apparatus, said internal packet is restored to said external packet when a destination address of said external packet including in said internal packet

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received at a network node apparatus on receiving side is included in a destination address of said external packet registered in a network node apparatus on receiving side.

366. (New) An IP transfer network, wherein said IP transfer network includes two or more network node apparatus, terminals are connected with said network node apparatus and form an address of an IP packet based on a telephone number, and a terminal-to-terminal communication connection control is carried out by using an IP packet including a call control when a sender address of said IP packet is included in a sender address registered in a network node apparatus on sending side.

367. (New) An IP transfer network, wherein said IP transfer network includes two or more network node apparatus, terminals are connected with said network node apparatus and form an address of an IP packet based on a telephone number, and a terminal-to-terminal communication connection control is carried out by using an IP packet including a call control when a receiver address of said IP packet is included in a receiver address registered in a network node apparatus on sending side.

368. (New) An IP transfer network, wherein said IP transfer network includes two or more network node apparatus, terminals are connected with said network node apparatus and form an address of an IP packet based on a telephone number, and a terminal-to-terminal communication connection control is carried out by using an IP packet including a call control when a sender address of said IP packet is included in a sender address registered in a network node apparatus on receiving side.

369. (New) A gateway, wherein said gateway is connected with an IP transfer network and a public switched telephone network, a terminal is connected with said IP transfer network, telephone machines are connected with said public switched telephone network including a signaling point function, and said gateway communicates with said IP transfer network by using an IP packet including a call control and communicates with said public switched telephone network by using said signaling point function, thereby to carry out a communication connection control between said terminal and said telephone machine.

370. (New) A gateway, wherein said gateway is connected with an IP transfer network and a public switched telephone network, a terminal is connected with said IP transfer network and communicates with it, and said gateway communicates with a telephone machine connected with said public switched telephone network by using a signaling point function.

371. (New) An IP transfer network, wherein said IP transfer network forms an internal packet based on a logical terminal on sending side and an external packet and decides a logical terminal on receiving side based on a logical terminal discrimination information of said formed internal packet, a header of said internal packet does not include a source address and does a destination address only, thereby to carry out a terminal-to-terminal communication connection control by using said internal packet including a call control.

372. (New) An IP transfer network, wherein there is provided two or more network node apparatus including two or more logical terminals, a network node apparatus on sending side forms an internal packet based on a logical terminal on sending side and an external packet, a

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network node apparatus on receiving side decides a logical terminal on receiving side based on a logical terminal discrimination information of said received internal packet, a header of said internal packet does not include a source address and does a destination address only, thereby to carry out a terminal-to-terminal communication connection control by using said internal packet including a call control.

373. (New) An IP transfer network, wherein there is provided two or more network node apparatus including two or more logical terminals, a network node apparatus on sending side forms an internal packet based on an external packet, a network node apparatus on receiving side restores said external packet, a communication with said internal packet is carried out at inter-network node apparatus, said internal packet includes a logical terminal discrimination information on receiving side, a header of said internal packet does not include a source address and does a destination address only, thereby to carry out a terminal-to-terminal communication connection control by using said internal packet including a call control.

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374. (New) An IP transfer network, wherein a network node apparatus includes two or more communication lines, a logical terminal is defined for each communication line, a network node apparatus on sending side forms an internal packet from an external packet for each logical terminal, a network node apparatus on receiving side restores said external packet from said internal packet for each logical terminal on receiving side, a communication with said internal packet is carried out at inter-network node apparatus, a header of said internal packet does not include a source address and does a destination address only, thereby to carry out a terminal-to-terminal communication connection control by using said internal packet including a call control.

375. (New) A network node apparatus, wherein said network node apparatus includes two or more logical terminals, forms an internal packet based on a logical terminal on sending side and an external packet and decides a logical terminal on receiving side based on a logical terminal discrimination information of said formed internal packet, a header of said internal packet does not include a source address and does a destination address only, thereby to carry out a terminal-to-terminal communication connection control by using said internal packet including a call control.

376. (New) A network node apparatus, wherein said network node apparatus includes two or more logical terminals, a network node apparatus on sending side forms an internal packet based on a logical terminal on sending side and an external packet, a network node apparatus on receiving side decides a logical terminal on receiving side based on a logical terminal discrimination information of said received internal packet, a header of said internal packet does not include a source address and does a destination address only, thereby to carry out a terminal-to-terminal communication connection control by using said internal packet including a call control.

377. (New) A network node apparatus, wherein said network node apparatus includes two or more logical terminals, a network node apparatus on sending side forms an internal packet based on an external packet, a network node apparatus on receiving side restores said external packet, a communication with said internal packet is carried out at inter-network node apparatus, said internal packet includes a logical terminal discrimination information on receiving side, a

header of said internal packet does not include a source address and does a destination address only, thereby to carry out a terminal-to-terminal communication connection control by using said internal packet including a call control.

378. (New) A network node apparatus, wherein said network node apparatus is connected with two or more communication lines, a logical terminal is defined for each communication line, a network node apparatus on sending side forms an internal packet from an external packet based on an external packet for each communication line, a network node apparatus on receiving side restores said external packet from said internal packet for each logical terminal on receiving side, a communication with said internal packet is carried out at inter-network node apparatus, said internal packet includes a logical terminal discriminating information on receiving side, a header of said internal packet does not include a source address and does a destination address only, thereby to carry out a terminal-to-terminal communication connection control by using said internal packet including a call control.

379. (New) An IP transfer network, wherein said IP transfer network includes two or more network node apparatus, a network node apparatus on sending side forms an internal IP packet from an external IP packet, a network node apparatus on receiving side restores said external IP packet from said internal IP packet, a communication with said internal IP packet is carried out between said network node apparatus on sending side and said network node apparatus on receiving side, thereby to carry out a terminal-to-terminal communication connection control by using said internal packet including a call control.

380. (New) A network node apparatus, wherein an IP transfer network includes two or more network node apparatus connected with terminals, a network node apparatus on sending side forms an internal IP packet from an external IP packet, a network node apparatus on receiving side restores said external IP packet from said internal IP packet, a communication with said internal IP packet is carried out between said network node apparatus on sending side and said network node apparatus on receiving side, thereby to carry out a terminal-to-terminal communication connection control by using said internal packet including a call control.
